May, 2002

NEPA Environmental Assessment

EAST LAKE SAMMAMISH INTERIM USE TRAIL

AND RESOURCE PROTECTION PLAN

Prepared for:

Federal Highway Administration and
Washington State Department of Transportation

Prepared by:

Adolfson Associates, Inc.
Parametrix, Inc.
and Associated Firms

U.S. DEPARTMENT OF

Washington State
Department of Transportation

COVER SHEET

East Lake Sammamish Interim Use Trail and Resource Protection Plan
Redmond, Sammamish, Issaquah, and King County, Washington

Submitted pursuant to 42 U.S.C. 4332(2)(c), 49 U.S.C. 303.
Submitted by:

U.S. Department of Transportation, Federal Highway Administration
Washington State Department of Transportation

5/6/02
Date of Approval

Elizabeth Healy
for Federal Highway Administration

4/30/02
Date of Approval

Hari Schaffstein
for Washington State Department of Transportation

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Abstract

The Proposed Action proposes to construct an 8- to 12-foot wide, 10.6 mile gravel trail for pedestrian and bicycle use on the former BNSF railbed located east of Lake Sammamish. The proposed East Lake Sammamish Interim Use Trail would be located between NE 70th Street in Redmond and NW Gilman Boulevard in Issaquah and would be open seven days a week for public use during daylight hours. The Interim Use Trail would remain in operation until a master plan for a permanent trail is completed and approved and a permanent trail is constructed on the railbed or other alignment. Some portions of the Interim Use Trail would remain in operation longer than others due to phased construction of the Master Plan Trail.

Comments on this EA are due by June 24, 2002 and should be sent to Robin Cole, King County Department of Executive Services, 500 Fourth Avenue, Room 320, Seattle, WA 98104. Copies of this EA are available at King County DCFM, 500 Fourth Avenue, Room 320, Seattle, WA 98104, for a cost of $29.00, which does not exceed the cost of reproduction.

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CHAPTER 1. PURPOSE AND NEED

This chapter summarizes the purpose and need for the project and provides a description of the project history. Figure 1-1 shows the location of the proposed East Lake Sammamish Interim Use Trail.

PROJECT HISTORY

In 1996, the Burlington-Northern/Santa Fe Railroad (BNSF) ceased operations along the proposed East Lake Sammamish Trail corridor. The Land Conservancy of Seattle and King County (The Land Conservancy) purchased the active railroad corridor from BNSF in April 1997, and owned the corridor continuously until September 1998. In 1997 King County and the Land Conservancy requested that the Surface Transportation Board (Board) grant interim trail use/railbanking status to this corridor under 16 U.S.C. 1247(d). Action was deferred by the Board until August 1998 when the BNSF notified the Board of its intent to act on its abandonment exemption authority and joined the requests for interim trail use of this corridor. The application to railbank the corridor was approved by the Board (Decision Summary, September 6, 1998) in August 1998 and a Notice of Interim Trail Use (NITU) was approved for issue. The Board conducted a National Environmental Policy Act (NEPA) Environmental Assessment (EA) prior to approving the Railbanking and NITU. No adverse impacts were identified from issuing the NITU and the subsequent salvage activity. The Land Conservancy sold the railbanked corridor on September 18, 1998 to King County. The County purchased the corridor with the intention of developing the corridor into the East Lake Sammamish Trail. The Land Conservancy was allowed to complete salvage of the rails, ties, and spikes after King County purchased the corridor. As part of the salvage operation, a significant amount of gravel and rock was placed on the railbed for erosion and sedimentation control purposes. King County is responsible for maintaining and managing the corridor to preserve the integrity of the former railbed to accommodate potential re-establishment of rail service. Under railbanking, the intent is to fulfill this obligation by installing and operating a recreation trail. However, even if King County ultimately develops a trail partially off the rail corridor, the county is still obligated to maintain the entire former railbed.

Due to controversy surrounding the proposed East Lake Sammamish Interim Use Trail, a State Environmental Policy Act (SEPA) Environmental Impact Statement (EIS) was completed for development of the Interim Use Trail and identified alternatives for consideration. No significant adverse effects from development were identified.

PURPOSE AND NEED FOR THE PROPOSED ACTION

Purpose

The purpose of the Proposed Action (Interim Use Trail) is to open the railbanked East Lake Sammamish corridor to public use for non-motorized transportation and recreation, and to manage the railbed and corridor in a way that protects human safety and the environment while a

permanent trail alignment and configuration of a trail within the corridor or elsewhere in the vicinity is designed and implemented.

Need

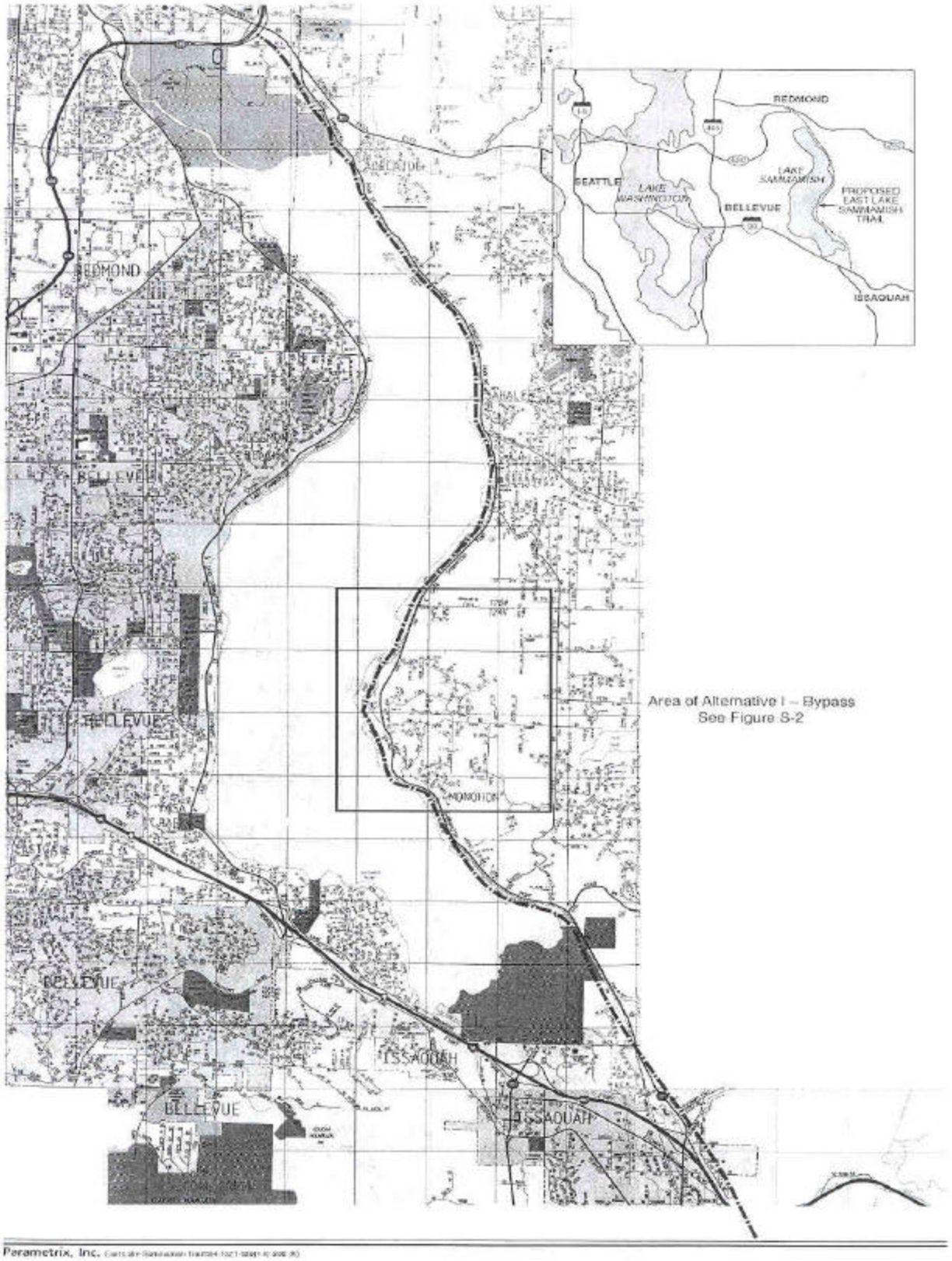
Increasing population growth to the east of Lake Sammamish has resulted in development of new retail, commercial and office centers at both the north and south ends of the proposed trail corridor. These new employment opportunities have increased the need for a trail connecting Redmond and Issaquah. The trail would not only be an alternative transportation corridor for commuters, but would also serve as a recreation connection between major regional parks and retail centers.

As early as 1971, the need for a north-south trail corridor to connect the Burke-Gilman Trail with the John Wayne Pioneer Trail (Iron Horse State Park) was identified by King County. The Burlington-Northern Rail Corridor was identified as a future urban trail corridor and was included in the *King County Urban Trails Plan* (1971). The growing demand for public recreation venues, including trails, has been continually addressed in county and city planning documents since the *King County Urban Trails Plan* was first adopted. Following its inclusion in the 1971 *King County Urban Trails Plan*, the proposed East Lake Sammamish Trail was included in the *King County Regional Trail Plan* (1992) and the *King County Non-motorized Transportation Plan* (1993a). The trail was also specifically included as part of the *King County Comprehensive Plan* (1994a) and the *King County Park, Recreation, and Open Space Plan* (1996). The trail has also been included in at least three other city and county planning documents. These documents identify the proposed East Lake Sammamish Trail as an important recreational facility, an important link in the County's regional trail system, as well as an alternative transportation corridor.

King County owns and manages a number of recreational trail resources, including many local and regional trails. At present, there are over 100 miles of paved and nearly 70 miles of unpaved regional trails in King County (King County, 2000c). Additional miles of trail are proposed for development, which will connect to existing trails in the region, and create a continuous network of non-motorized transportation corridors. Of the existing trails within the King County trails system, the Burke-Gilman and Sammamish River Trails are perhaps the most well-known and most highly used paved trails. The Burke-Gilman and Sammamish River Trails connect in Bothell, forming a continuous trail from Seattle to Redmond.

The proposed East Lake Sammamish Interim Use Trail would connect to the Sammamish River Trail at the north end via Marymoor Park, providing a continuous system of trails from Issaquah, north to Bothell/Kenmore/Lake Forest Park and then to Ballard in Seattle. At the south end, the trail would be approximately one-half mile from the Highpoint/Issaquah-Snoqualmie Trail which is planned to connect to the Preston-Snoqualmie Trail in the future. The proposed East Lake Sammamish Interim Use Trail would also connect to the south end of Issaquah's Pickering Trail (King County, 1998d).

In 1985, King County selected the transportation engineering firm of Cottingham and Associates to identify options for a north south trail along the east side of Lake Washington. The County had first identified the rail corridor as a future trail in 1971, but in the mid eighties it did not



Parametrix, Inc.

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NOT TO SCALE

Proposed Trail

Figure 1-1
Site Location Map
East Lake Sammamish Trail

appear that the railroad was ready to discontinue use. King County was interested in identifying interim solutions that could be implemented at that time. The "*Cottingham Study*" recommended eventual use of most of the rail corridor. However, in light of adjacent property owner complaints and assertions that the property was not owned by the railroad, Cottingham concluded that the cost to King County of property acquisition and litigation would preclude using the railbed in controversial areas and, thus, recommended that the some areas should be avoided.

King County did not elect to implement the *Cottingham Study*, nor did the County Council endorse or adopt the document. Review of the 15 year old *Cottingham Study* for applicability to the current project reveals two significant facts. Study authors did not verify adjacent property owners' claims about the ownership of the property. In fact, the railroad owned, and King County now owns, the railroad corridor primarily in fee. Less than twenty percent of the length of the corridor is now held by the County in less than fee ownership. Additionally, the *Cottingham Study* failed to incorporate in its analysis the federal Railbanking program, as amended by Congress in 1983, designed to preserve rail corridors, which Congress recognized as irreplaceable national assets. The Railbanking program gave King County the ability to obtain the same rights and responsibilities as the railroad had for protecting, using and managing the rail corridor regardless of the nature of the railroad's ownership.

Given that the County could obtain the necessary property interest in the entire rail corridor from a single source, through railbanking, the acquisition of the property in the controversial area was not an impediment to siting the Interim Use Trail entirely on the railbed. The alignment recommended in the *Cottingham Study* was considered but rejected for the Interim Use Trail, because the objective of the Interim Use Trail is to open the property purchased by the County to public use while controversial and complex issues are studied for a permanent Class 1 trail. An alignment based on the *Cottingham Study*, and developed by a community group, is being evaluated as an alternative in the Master Plan EIS which is in the early stages at this time.

In addition to the inclusion of the trail in various planning and policy documents, the King County Council has passed ordinances in support of the East Lake Sammamish Trail through its adoption of the 1997, 1998, 1999, and 2000 King County budgets. Each budget contained acquisition, operations, and/or Capital Improvement Program money for the East Lake Sammamish Trail project (Ordinance 12538, 1997 Budget; Ordinance 12926, 1998 Budget; Ordinance 13340, 1999 Budget; Ordinance 13678, 2000 Budget).

Relationship of Interim Use to Master Plan

As previously described, the Proposed Action will allow public use of the railbanked corridor until a master plan for permanent development of the East Lake Sammamish Trail can be completed and implemented ("Master Plan"). Irrespective of whether the County ultimately determines to approve a final trail in its subsequent Master Planning process, the Interim Use Trail and resource protections considered in this EA provide public benefits such as interim recreational opportunities, erosion/sediment controls, and natural resource preservation.

An Interim Use Trail would be in place until the Master Plan is completed and implemented, or until a decision is made to disallow public use of the railbed. Based on the current schedule for

developing and implementing improvements recommended in the Master Plan, those improvements will supercede the Interim Use Trail by 2015 at the latest. If the Master Plan is not implemented by 2015, additional environmental review would be necessary to continue public use of those portions of the railbed not developed under the Master Plan. The Master Plan NEPA/SEPA environmental review will consider the cumulative impacts of implementing and operating Master Plan alternatives.

ENVIRONMENTAL REVIEW PROCESS

The Draft SEPA EIS for the East Lake Sammamish Interim Use Trail was published on May 19, 2000, and public comments were received through July 3, 2000. A public hearing on the Draft EIS was held June 20, 2000. All comments on the Draft EIS were addressed and a Final EIS was published on August 25, 2000.

The Interim Use Trail is partly funded with Transportation Equity Act for the 21st Century (TEA-21) funds, which are administered by FHWA. The use of these federal funds triggers the requirement for NEPA review prior to expending FHWA funds to implement the proposal. This EA has been prepared in accordance with FHWA's NEPA requirements as set forth in *Guidance for Preparing and Processing Environmental and Section 4(F) Documents* (FHWA, 2001). A combined NEPA/SEPA environmental document will be prepared for the East Lake Sammamish Trail Master Plan.

This NEPA EA was issued on May 10, 2002 by FHWA. The public comment period will last from May 10, 2002 through June 24, 2002. A public hearing will be held on June 12, 2002. King County will respond to public comments, and it is expected that FHWA will issue a Finding of No Significant Impact (FONSI) in Summer, 2002.

ISSUES AND CONCERNS

Through the planning and scoping processes, three broad categories of issues emerged regarding interim trail use: safety for adjacent property owners and trail users; environmental protection and stewardship of natural resources; maintenance and operations to ensure ongoing trail and public land management (King County, 1999a). Other issues of importance to adjacent property owners were raised, including the potential effect the trail might have on property values and the underlying ownership of the corridor following its transfer from the railroad to the County via the Land Conservancy.

TOPICS EXAMINED BUT NOT INCLUDED

In accordance with FHWA's *Guidance for Preparing and Processing Environmental and Section 4(F) Documents* (FHWA, 2001), only those impact areas with uncertain significance are discussed in this EA. Identified impact areas which do not have a reasonable possibility for individual or cumulative significant environmental impacts are not discussed.

SUMMARY OF SCOPING COMMENTS

Scoping comments received prior to the initiation of SEPA environmental review included a number of areas of concern. Identified areas of concern and the number of comments received are summarized in Table 1.1 below. Specific items of concern are listed under each main heading and cover the primary issues identified during the scoping process. These SEPA scoping comments were used to focus this NEPA EA evaluation.

Table 1-1. Summary of Scoping Comments

Area of Concern	Number of Comments Received
Trail User Safety • Pedestrian/vehicle conflicts at trail crossings and blind driveways • Speed of bicyclists • Conflicts between bicyclists and pedestrians	95
Recreation • Trail should be multi-use • Need regional recreation and transportation resources	27
Noise • Noise should be mitigated • Noise at night will increase	15
Aesthetics • Homeowner's views will be impacted	3
Public Facilities and Services • Parking for trail users • Litter and animal waste control • Restroom facilities • Trail maintenance and funding of maintenance	57
Runoff / Water • Surface water/stormwater/drainage must be addressed • Water quality protection	49
Erosion • Erosion and sedimentation will be a problem	6
Wildlife • Habitat connectivity • Construction/operation impacts on wildlife	26
Fish • Construction/operation impacts on salmon habitat and recovery • Improve fish passage with improved culverts	31
Wetlands • Wetland impacts from railroad tie removal and gravel placement • Effects of runoff on wetlands	6

Area of Concern	Number of Comments Received
Other Natural Resource Issues • Construction impacts on the environment • Construction/operation impacts on sensitive areas • Impacts to the environment from gravel placement	28
Property Owner Safety and Security • Trespassing, vandalism, and crime • Liability of homeowners • Safe access to waterfront areas for homeowners • Public use of private driveways and access roads	47
Alternatives • Re-route to East Lake Sammamish Parkway • Keep trail on railbed • Avoid bisected properties • Bypass route impacts to property owners and environment	87
Land Use • Property values will be affected • Impacts to private and semi-private spaces • Ownership and historical/existing uses	12
Property Rights • King County does not own the land • Encroachment on private property	22
Interim / Master Plan • Complete Master Plan before Interim Use Trail EIS	18
CAG • Conflict of interest issues	3
Response to Public Comments • What does King County do with public comments?	2
Budget • Funding for trail • Funding for litigating quiet title actions	24
SEPA Process • Two EIS process is fragmented approach • Impacts of transition from interim to master plan use • Lead agency	37
Cottingham Study • King County should follow the Cottingham Study	5
Other • Crossing fee policy • Meet ADA requirements	9

CHAPTER 2. ALTERNATIVES

PROJECT ACTIONS

A Preferred Alternative and a No Action Alternative were analyzed for the interim use of the East Lake Sammamish Trail in this NEPA EA. The Preferred Alternative is described in detail below, and both the Preferred Alternative and the No Action Alternative are summarized in Table 2.2 at the end of this chapter.

Alternative 1 Bypass was evaluated in detail in the SEPA EIS (King County, August 25, 2000). This alternative (a 1.6 mile bypass of the existing railbed) was found to have serious safety issues for trail users and vehicles traveling along East Lake Sammamish Parkway due to the proximity of the bypass section of trail to the Parkway. Specific adverse impacts associated with the Alternative 1 Bypass include:

- Potential pedestrian and bicycle conflicts with existing vehicular traffic along East Lake Sammamish Parkway and East Lake Sammamish Place
- An additional 26 driveways or roads which intersect with the bypass route compared with the Preferred Alternative
- Narrowing roadway width and removing on-street parking on west side of East Lake Sammamish Place, thus reducing availability of parking for adjacent property owners along both sides of East Lake Sammamish Place
- Potential for an increase in parking by trail users along East Lake Sammamish Parkway and East Lake Sammamish Place
- Construction of the ramp to East Lake Sammamish Parkway requiring excavation, fill placement, construction of a retaining wall, and removal and replacement of guardrails
- Slightly greater impact to wetlands within the corridor

After thorough environmental analysis under SEPA, Alternative 1 was eliminated from further consideration because it was found to have more adverse environmental impacts and would not provide as safe a trail as the Preferred Alternative.

Preferred Alternative

In 1998, the King County Council directed the King County Parks Department to prepare an Interim Use Trail Plan for the East Lake Sammamish Corridor, i.e., the railbed (Ordinance 13340, September 1998). In keeping with this direction, as stated in the *East Lake Sammamish Interim Trail Use and Resource Protection Plan* (Draft, King County, 1999a), the project objectives are to:

1. Open the railbed to the public during master trail planning and construction phases.
2. Protect the environment.
3. Create an interim trail that is safe for trail users and adjacent property owners.

4. Build a positive, long-term relationship with local residents, trail users, and other constituents.
5. Establish and maintain a trail that is a good neighbor to adjacent property owners and local communities.

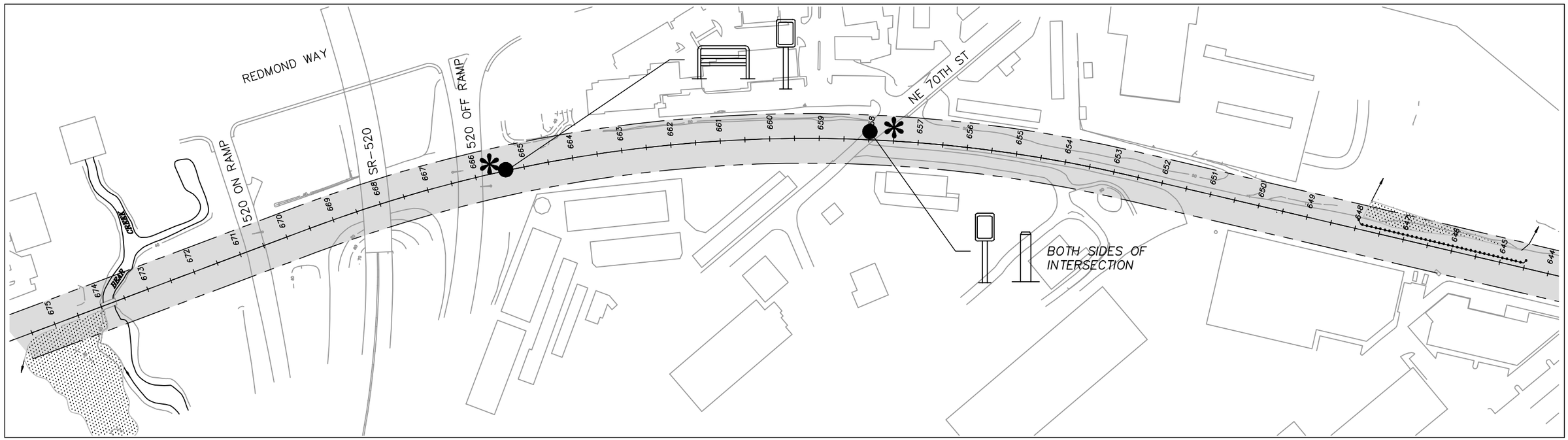
Under the Preferred Alternative, King County proposes to construct an 8- to 12-foot wide, 10.6 mile gravel trail for pedestrian and bicycle use on the former BNSF railbed located east of Lake Sammamish. See Figures 1-1, 2-1, 2-2, 2-3, 2-4, 2-5, 2-6, 2-7, 2-8, 2-9, and 2-10. Other improvements would include fencing as appropriate and signage for trail etiquette and safety purposes. The proposed East Lake Sammamish Interim Use Trail would be located between NE 70th Street in Redmond and NW Gilman Boulevard in Issaquah and would be open seven days a week for public use during daylight hours. The Interim Use Trail, or portions of it, would remain in operation until a master plan for a permanent trail is completed and approved and a permanent trail is constructed on the railbed or other alignment. Project elements are summarized in Table 2-1.

Resource Protection and Maintenance/Operation Measures

The East Lake Sammamish Trail Interim Use and Resource Protection Plan (Draft, King County, 1999a) was designed to "promote human safety, protect the environment, deter trespass onto adjacent property, inform trail users regarding trail regulations, and create an aesthetically pleasing interim trail." The plan calls for frequent, scheduled trail inspections to look for drainage problems, surface conditions, dump sites, illegal activity, and access issues at the crossings and trail heads (Table 2.1). Specific resource protection measures that would be implemented as part of the Preferred Alternative, and maintenance/operation practices that would continue, include:

- Split-Rail Fencing – Three and a half-foot split-rail cedar fences would be located adjacent to environmentally sensitive areas such as wetlands, streams, and steep slopes. The fences would be located a minimum of 3 feet and a maximum of 6 feet from the trail's edge.
- Drainage Maintenance – Ditches and culverts would continue to be maintained as needed, to allow for effective drainage. Nominal work would be done to repair damage, restore drainage paths and water flow, and undertake proactive measures in identified areas where there is a clear and present potential for acute drainage incidents.
- Litter and Dog-waste Control – Litter and dog-waste bag receptacles would be located along the trail at public access points.
- Signage – Signage indicating sensitive areas and need to avoid these areas would be installed.
- Railroad Tie Removal – Remaining railroad ties would be removed.

No additional construction or resource protection activity would be required to specifically address conditions created by the salvage operation.



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0 100 200'
SCALE IN FEET

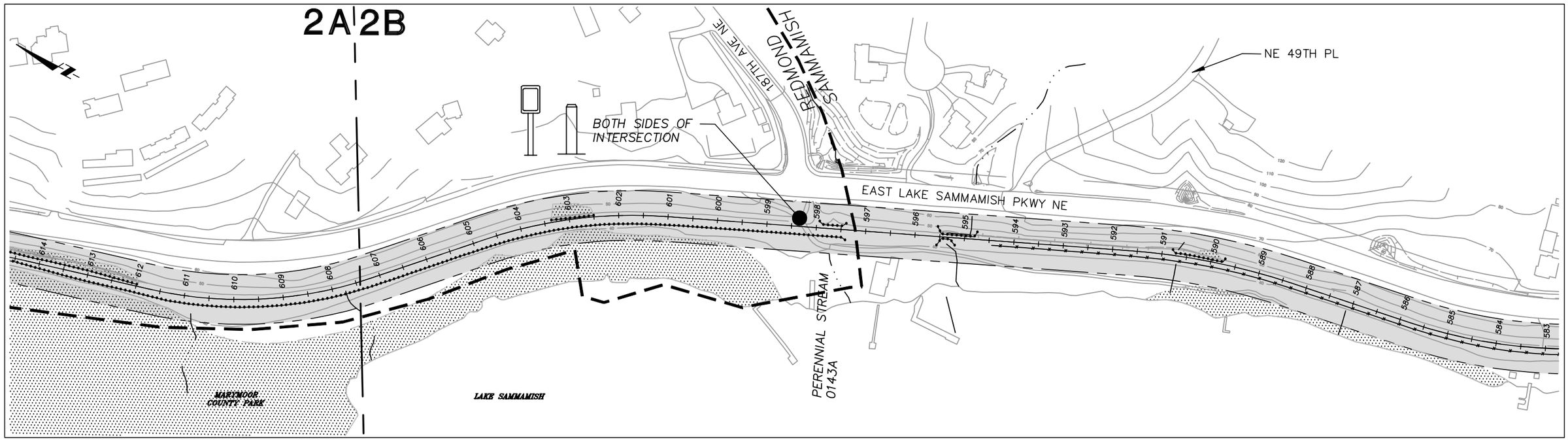
Legend

- Sign
- Bollards
- Blockade
- Wetlands
- Right-of-way
- Public Access Point
- Limit of Fencing (split rail)
- Limit of Fencing (chain link)
- Limit of Breakaway Pylons
- Limit of Guardrail
- Limit for Tie Removal
- Municipal Boundaries

Notes

1. Proposed mitigation items are diagramatically located.

Figure 2-1
East Lake Sammamish Trail
Draft - Interim Plan



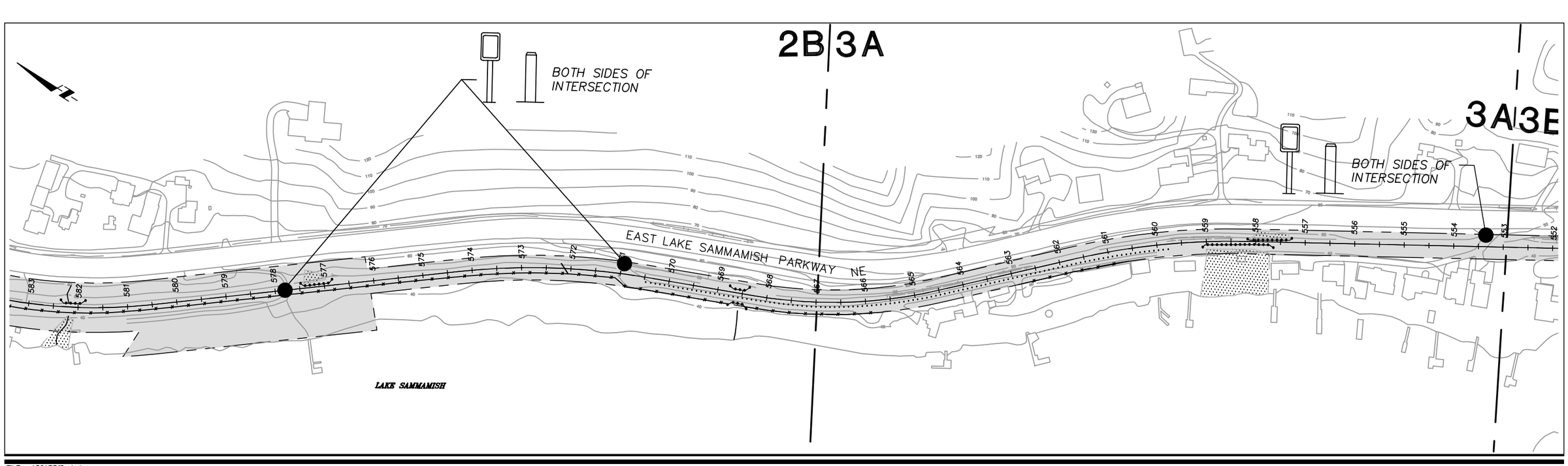


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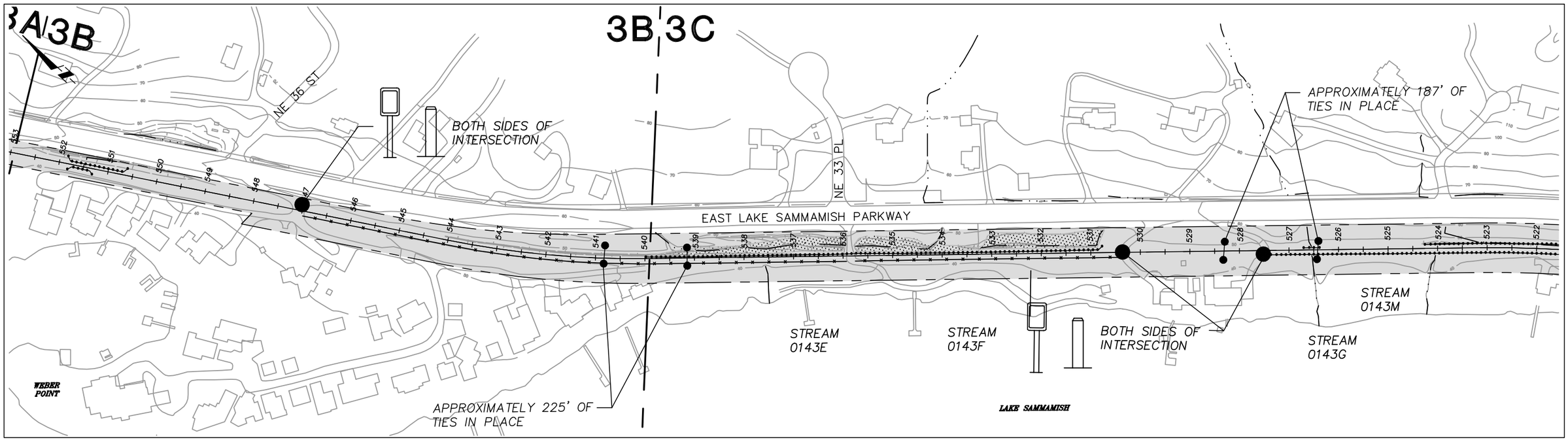
Figure 2-2
East Lake Sammamish Trail
Draft - Interim Plan



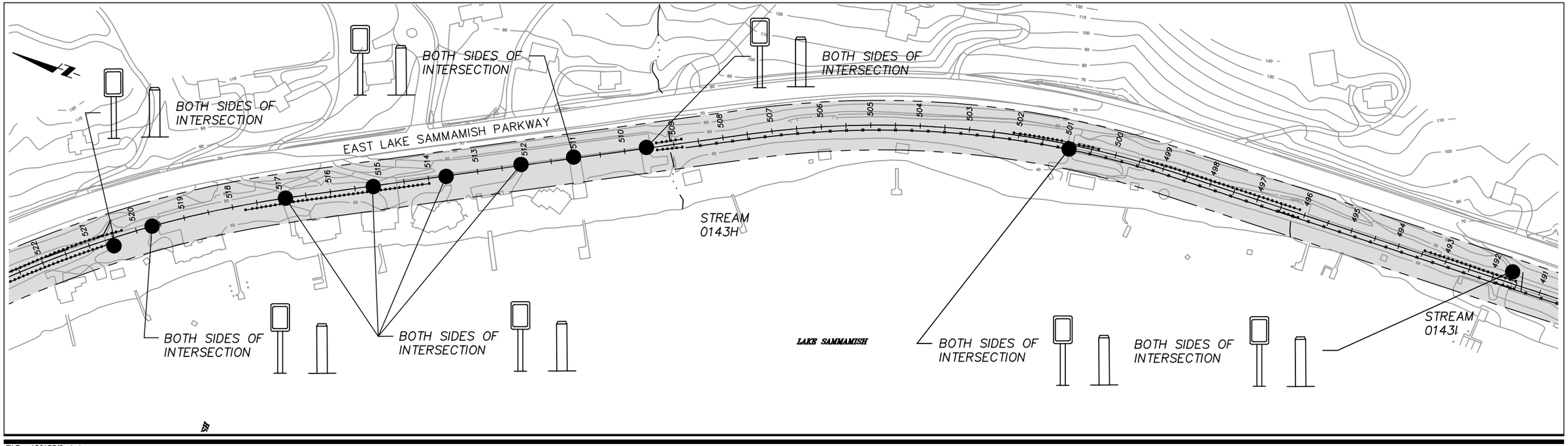


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Figure 2-3
East Lake Sammamish Trail
Draft - Interim Plan

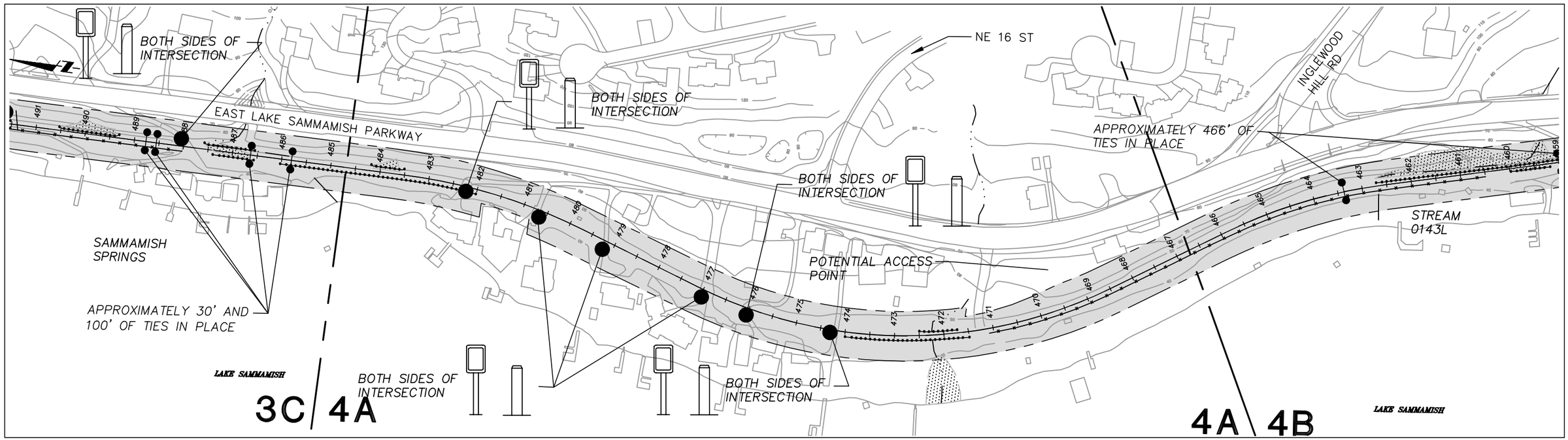

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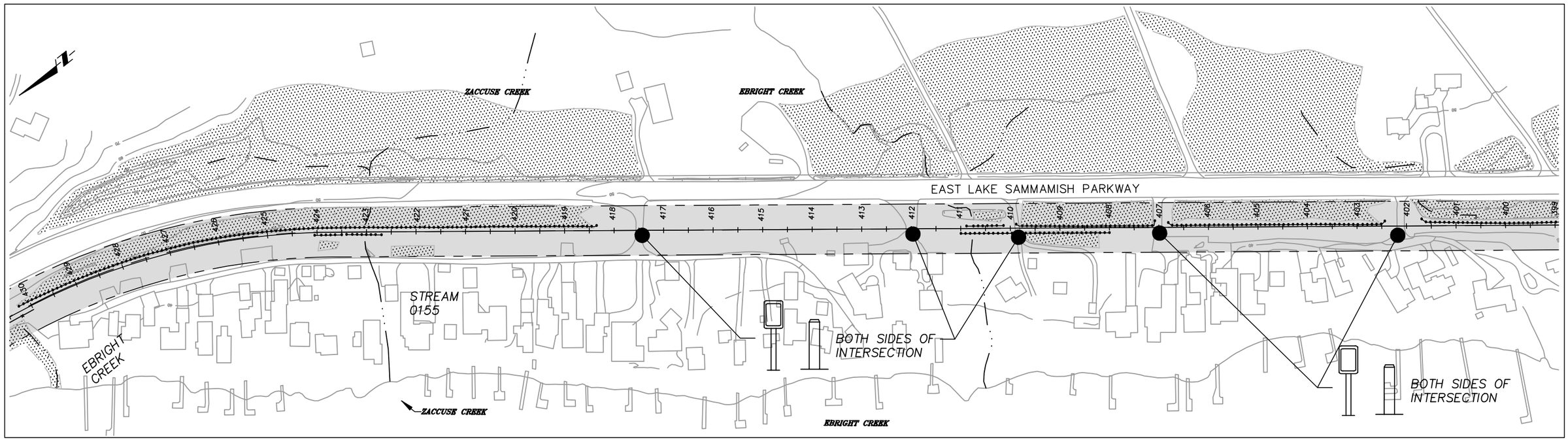
Figure 2-4
East Lake Sammamish Trail
Draft - Interim Plan



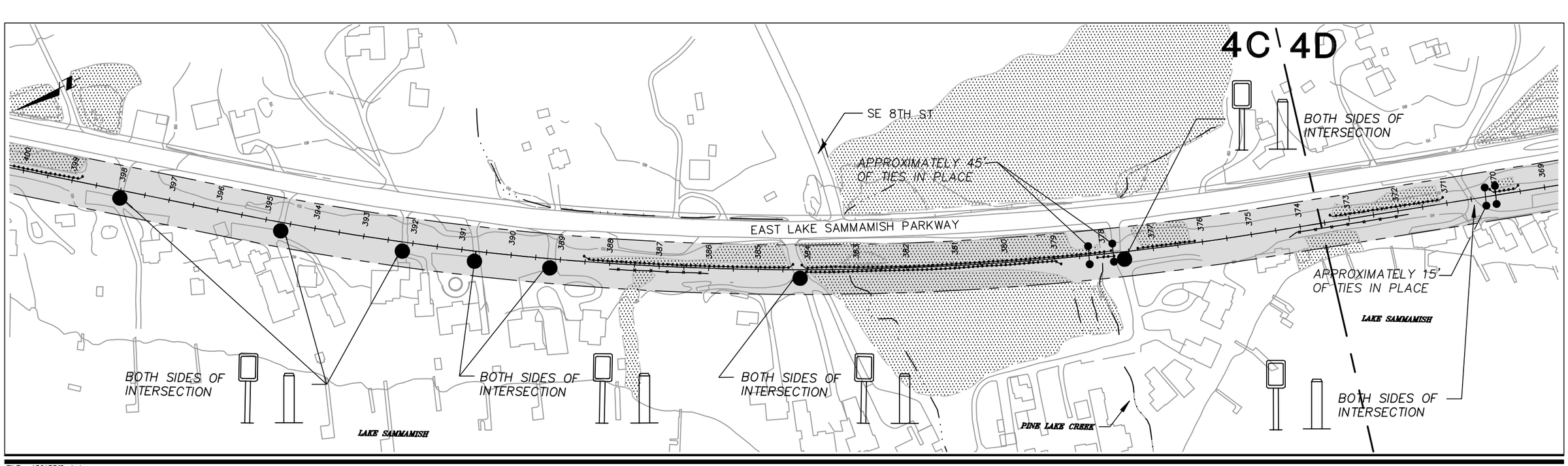


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Figure 2-5
East Lake Sammamish Trail
Draft - Interim Plan

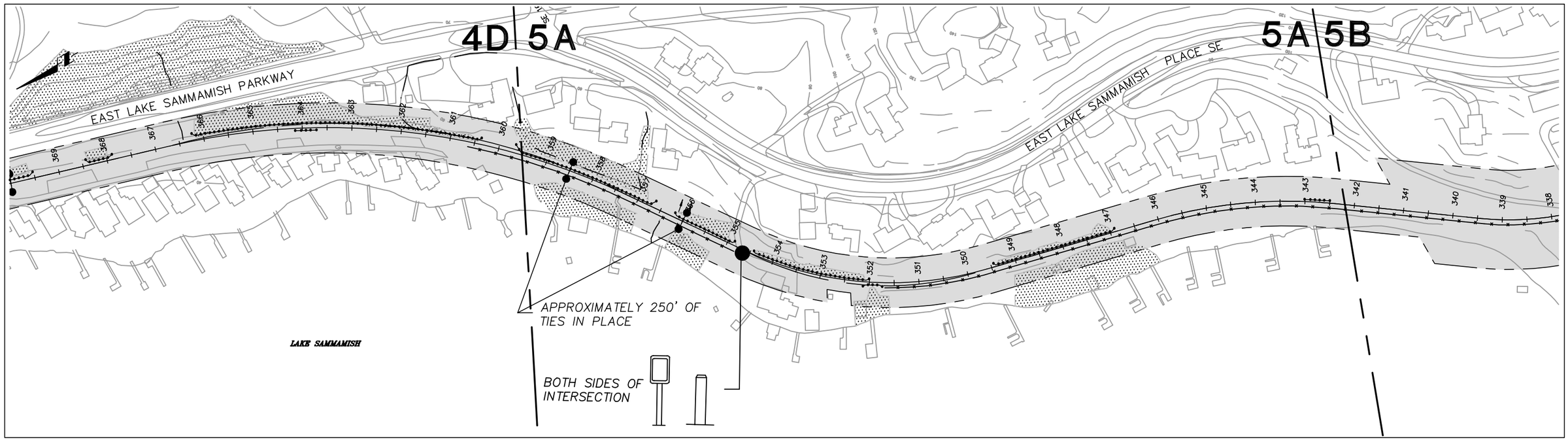

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Figure 2-6
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Draft - Interim Plan

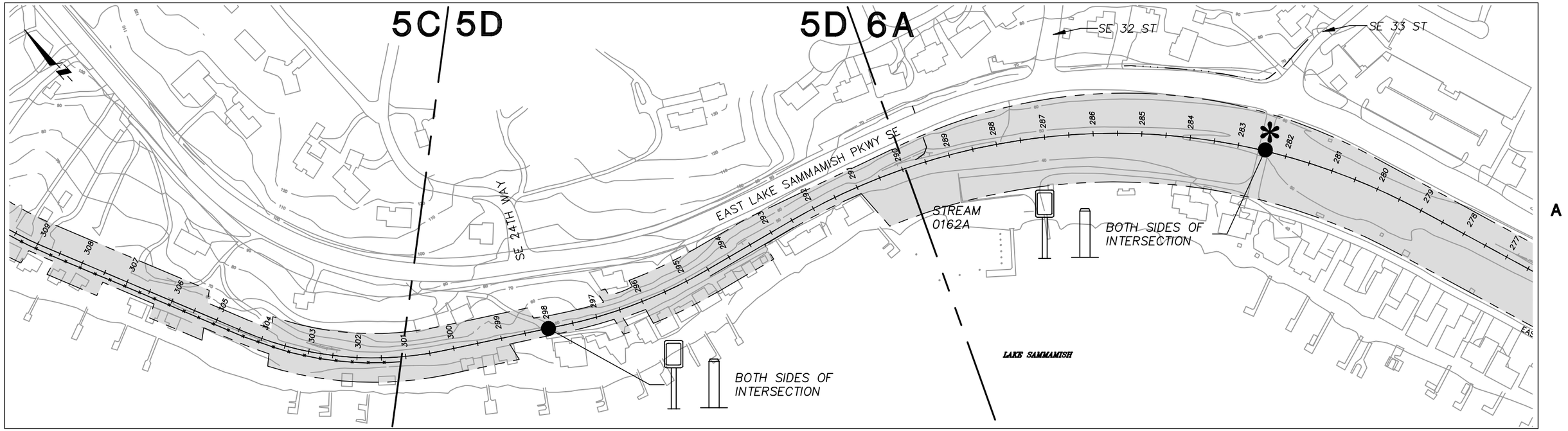

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Figure 2-7
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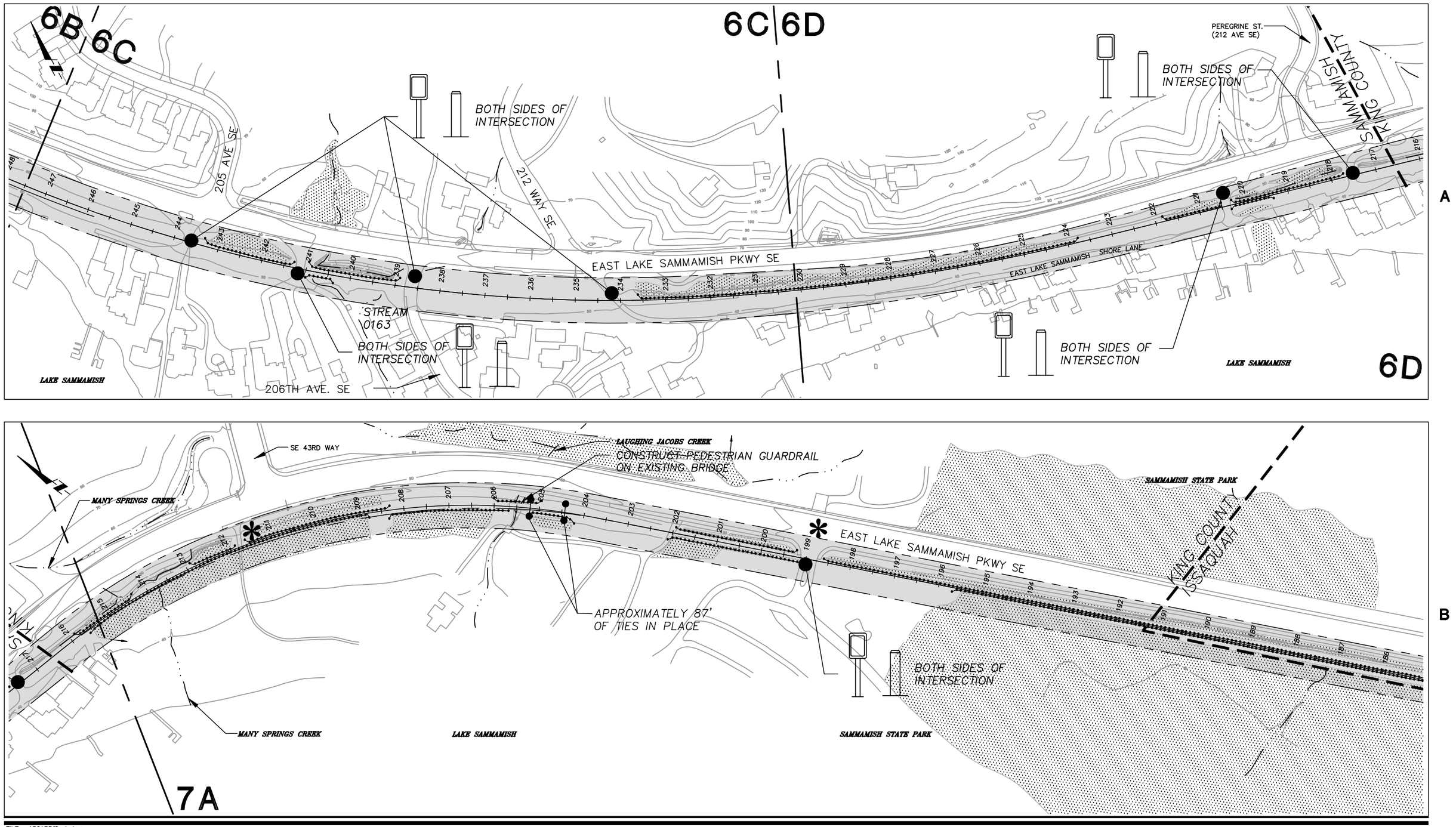
Draft - Interim Plan



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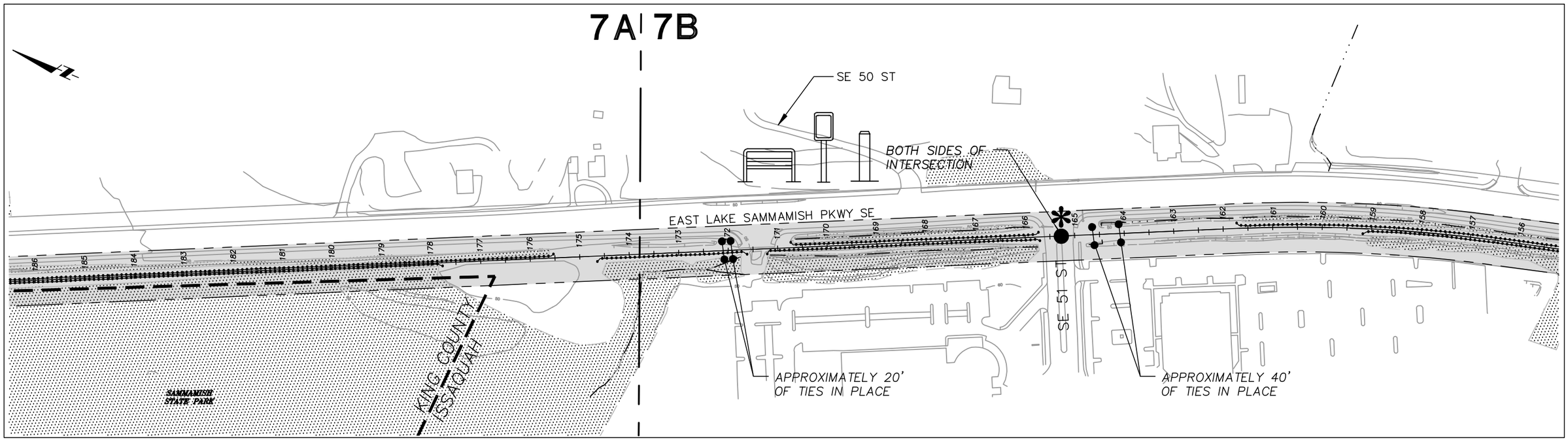
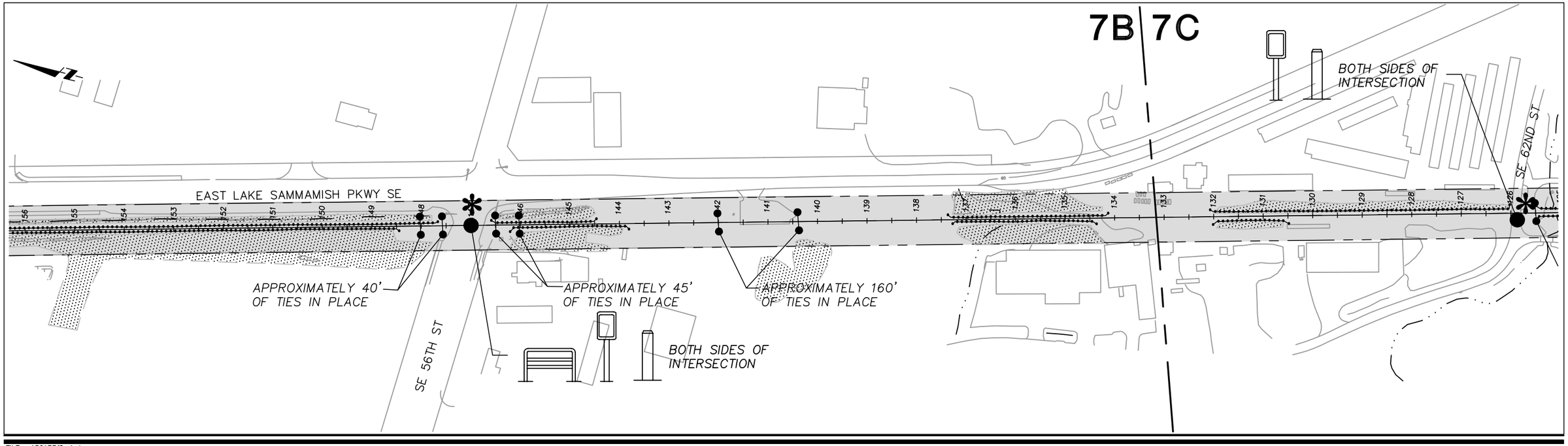
Draft - Interim Plan





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0 100 200'
SCALE IN FEET

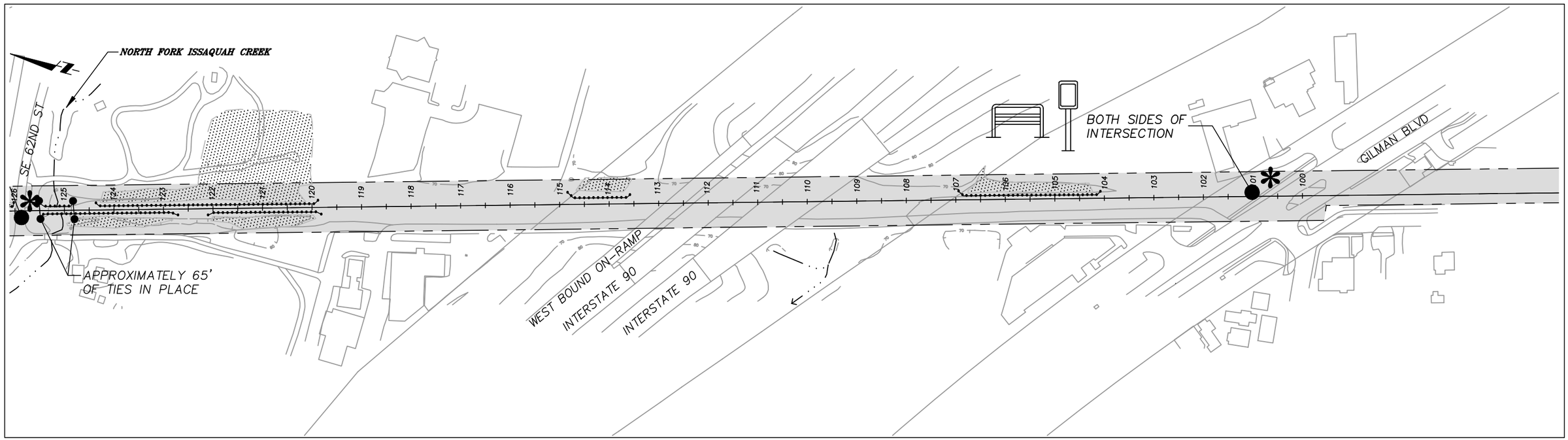
Legend

- Sign
- Bollards
- Blockade
- Wetlands
- Right-of-way
- Public Access Point
- Limit of Fencing (split rail)
- Limit of Fencing (chain link)
- Limit of Breakaway Pylons
- Limit of Guardrail
- Limit for Tie Removal
- Municipal Boundaries

Notes

1. Proposed mitigation items are diagramatically located.

Figure 2-9
East Lake Sammamish Trail
Draft - Interim Plan



FILE: 15213318_A.dwg
DATE: 08/01/00

0 100 200'
SCALE IN FEET

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- Sign
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- Limit of Guardrail
- Limit for Tie Removal
- Municipal Boundaries

Notes

1. Proposed mitigation items are diagramatically located.

Figure 2-10
East Lake Sammamish Trail
Draft - Interim Plan

Table 2.1 East Lake Sammamish Trail - Interim Use and Resource Protection Plan - Preferred Alternative

Interim Trail Segment	Figure No.	Blockades	Gravel (cy)	Trail Length (lf)	Bollards	Trail Signs Safety	Trail Signs Etiquette	Roadway Signs	Bridge Upgrades	Split-rail Fence (lf)	Chain-link Fence (lf)	Traffic Pylons (lf)	Guardrails (lf)	Access Points	Ties in-place (lf)
1	1	3	364	2950	2	5	2	4		680				3	
2A	1,2		358	2900	2	2	2	2		3480					
2B	2		500	4050	6	6	3	6		1650	2710	350			
3A	2		173	1400	2	2	1	2		250	350	725			45
3B	3		160	1300	2	2	1	3		185	710				90
3C	3,4		682	5530	26	26	4	26	1	3370	3030				1135
4A	4		228	1850	12	12	1	12		600	445				
4B	4		284	2300	2	2	2	2		1730	855		585		1693
4C	4,5		870	7050	28	28	5	28		4675	520		250		730
4D	5,6		321	2600	2	2	2	2		1015	290				950
5A	6		213	1725	2	2	1	2		1060	1450				650
5B	6		210	1700	2	2	1	2		120	1700				
5C	6,7		299	2425	2	2	2	2		700	1660				
5D	7		136	1100	2	2	1	2							
6A	7		395	3200	4	4	2	4		75				1	
6B	7		133	1075			1			1010					
6C	8		216	1750	8	8	1	8		1055					
6D	8		185	1500	4	4	1	4		1235					
7A	8,9		515	4175	2	2	3	2	1	6615				2	
7B	9	4	503	4075	4	4	3	4		5670				2	
7C	9,10	1	398	3225	2	4	2	2	1	2430				2	
TOTAL		8	7139	57880	116	121	41	119	3	37605	13720	1075	835	10	5293

Public Access Points

Ten public access points are proposed along the 10.6 mile length of the trail. These access points are shown on Figures 2-1, 2-2, 2-3, 2-4, 2-5, 2-6, 2-7, 2-8, 2-9, and 2-10.

The County would also work with the Cities of Redmond, Sammamish, and Issaquah to identify those areas where public road right-of-way and public trail right-of-way meet and allow for local access that does not impact adjacent property owners' driveways.

Construction Actions Associated with the Preferred Alternative

To allow for safe public use of the Interim Use Trail, the following construction and maintenance activities would occur:

- Gravel – Gravel (5/8" minus/approximately 4" depth) would be placed along the entire length of the trail prior to the trail's opening for interim use. Approximately 7,100 cubic yards of gravel would be placed along the 10.6 miles of railbed during construction.
- Bollards – One removable bollard per side would be located at all trail/roadway crossings. The bollards would be located on the railbed between the existing concrete blocks where present. Where concrete blocks are not currently present, they would be installed two per side at each crossing with one removable bollard per side.
- Fencing – Five-foot, black-coated galvanized, direct-drive posts with concrete footings every third post and 5-foot black vinyl-coated chain-link fencing would be located where safety and liability, proximity and trespass, and privacy issues necessitate. Fences would be located a minimum of 3 feet and a maximum of 6 feet from the proposed Interim Use Trail edge. Adjacent property owners may choose to further upgrade fencing at their own expense as long as access, safety, and liability requirements are met. Some sections of chain-link fence may be located closer than 3 feet or farther than 6 feet when adjacent land uses and/or environmental conditions necessitate.
- Wood Guardrail – Wood posts with wood rail guardrail would be located adjacent to roads accessing adjacent properties where trail delineation is required.
- Signs – Trail use etiquette, traffic advisory (including "No Parking signs"), and property delineation signs would be located adjacent to the trail and at road and driveway crossings. Signs would be placed at a minimum of 3 feet and a maximum of 6 feet from the proposed interim trail edge.
- Bridge Upgrades – The bridges located over Laughing Jacob's Creek, North Fork Issaquah Creek, and Stationing Point 488 would be fitted with 48-inch wood railings with chainlink fabric. The bridge at Stationing Point 488 would be resurfaced for safety.
- Vegetation Management/Removal – Vegetation located adjacent to the trail that limits sight distance would be trimmed or removed if necessary. The need for vegetation management would be necessary at many street and driveway crossings prior to interim use and at all street and driveway crossings as an ongoing maintenance activity and safety concern.

Table 2.2. Impacts Summary

Element of the Environment	Preferred Alternative	No Action Alternative
Earth and Groundwater	• Placement of 7,100 cubic yards of gravel on rail bed. • Potential erosion/sedimentation from cleaning of sediment from ditches, culverts. Potential impacts greatest along Segments 2 through 6. • Potential minor erosion and sedimentation during railroad tie removal, trail surfacing, fence and sign construction, removal of hazard trees. • Potential for incidental leaks of oils, lubricants, fuels during construction. • Potential erosion if soils left exposed after construction.	• Routine ditch and culvert maintenance would be performed.
Surface Water	• Potential increase in fine sediment from gravel placement and erosion along ditches, wetlands, or streams from fence construction. • Potential for spills of fuels or oils from heavy construction equipment. • Ongoing vegetation removal and manual ditch cleaning could cause temporary water quality impacts. • Minor impacts from wetland filling; present wetland functions limited. • Minor increases in dog feces vehicular use for trail maintenance. Potential bacterial loading to streams • Potential erosion, particularly during storms, of trail shoulder from bike and pedestrian use. • Minor increase in roadway pollutants from increased trail user traffic.	• Impacts from ditch and culvert maintenance similar to Preferred Alternative. • No long-term impacts from trail use.
Plants and Wetlands	• Limited plant removal for fence construction and safe trail operation. Plants expected to recolonize area following construction. Potential for increased Himalayan blackberry growth along fence lines. • Removal of hazard trees, trimming of vegetation to maintain sight lines at road crossings. • Minimal impacts to weedy annual forbs and grasses on rail bed. Minimal vegetation on trail surface. • Minor trampling of trailside vegetation during trail use. • Filling of portions of 5 wetlands totaling .09 acre during construction. No measurable change to wetland function; existing functions low. • Potential for accidental spills of surfacing material into wetlands. • Potential for minor wetland sedimentation during culvert maintenance. • Increased human and pet wetland disturbance, overgrowth of invasive plant species over long term.	• Impacts from ditch and culvert maintenance similar to Preferred Alternative. • No long-term impacts from trail use.

Element of the Environment	Preferred Alternative	No Action Alternative
Wildlife and Fish	• Temporary wildlife displacement during construction. Impacts greatest in trail segment 2. • Long term noise and visual disturbance from dogs, restricted access from fencing, and trampling of vegetation. Urban species would remain common. • Minor restriction in access to sensitive habitats for larger mammals from fencing. • Potential short-term and long-term displacement of nesting/foragingpileated woodpeckers. • Potential for temporary sedimentation of fish bearing streams, spawning areas during construction. • Potential spillage of hazardous materials into streams, temporary fish displacement from construction noise. Potential impact to prominentcoho spawners. • Potential increase in human disturbance of streams during trail use. • Potential temporary downstream release of sediment, debris from ditch and culvert cleaning.	• No change in wildlife presence. Urban generalist species would remain common. • Impacts to fish from ditch and culvert cleaning would be similar to the Preferred Alternative.
Land and Shoreline Use	• Construction disturbance to 350 residences for one to two days during gravel placement. • Perception of reduced privacy, visual impacts, and safety over long term. • Greatest impact to properties bisected by rail corridor.	• No construction disturbance to residences from gravel placement. • No perceived impacts from trail use. • Temporary periodic disturbance from ditch and culvert cleaning.
Socio-Economic	• Perceived impacts to property values. • Perceived increase in opportunity for trespass or private property vandalism. • Potential increase in accidents between trail users and residents; gravel surface will minimize travel speeds and accident potential.	• Potential safety concerns for users of shoulders of East Lake Sammamish Parkway. Minimal separation from vehicles provided.
Transportation	• 1,428 one-way truck trips over 8 to 12 weeks of construction; potential for temporary traffic delays. • 200 peak weekend day vehicle trips expected over long term. • Daily parking demand of 125 cars on peak summer weekend. • Potential conflicts between trail users and cars at road crossings.	• Potential safety concerns for users of shoulders of East Lake Sammamish Parkway. Minimal separation from vehicles provided. • Vehicle traffic limited to maintenance vehicles periodically entering railbed to perform maintenance.
Cultural and Historical Resources	• Limited subsurface disturbance associated with construction. • Minor potential for disturbance of cultural resources during culvert maintenance, sign and fence installation.	• No fence or sign installation. Disturbance potential from ditch and culvert maintenance similar to Preferred Alternative.
Visual	• Potential visual impacts to some existing residences. • Views of fencing from residences minimized.	• Trail closed to public use. No fencing constructed. No visual impacts.

Proposed Implementation Schedule

The implementation schedule, including activities that have already occurred, for the East Lake Sammamish Interim Use Trail is as follows:

• Transmit Executive Proposed Interim Use and Resource Protection Recommendations to King County Council for review and adoption	August 25, 2000
• King County Council adopts Interim Use and Resource Protection Plan	December 2000
• Obtain required permits	June 1999 through May 2002
• Begin implementation of permitted improvements	July 2002

No Action Alternative

The No Action Alternative would not require any Interim Use Trail construction. However, some resource protection maintenance and operations functions would continue to occur in part due to the County's responsibility under railbanking. These functions would include:

- Drainage Maintenance – As with the Preferred Alternative, ditches and culverts would be maintained as necessary, to allow for effective drainage.
- Vegetation Removal – Vegetation would be removed or trimmed along the railbed in order to keep the corridor clear. Low levels of edging, mowing and weed removal would be conducted to maintain lines of sight and discourage trash dumping.
- Litter Removal – Litter would be picked up and removed as necessary.

Under this alternative, periodic trail inspections to look for and address drainage problems, surface conditions, dump sites, illegal activity, and/or access issues at roadway crossings would be conducted in response to specific public requests, and when weather conditions could result in acute drainage issues.

Public Access

There would be no public access under this alternative.

CHAPTER 3. ENVIRONMENTAL, SOCIAL, AND ECONOMIC IMPACTS

IMPACT SUMMARY

This chapter presents a concise description and discussion of the project area for various elements of the environment. The elements of the environment addressed in this Environmental Assessment (EA) are described and analyzed to the extent needed to support an environmental determination under NEPA and FHWA guidelines. No significant adverse impacts were identified for any element of the environment evaluated in this EA and listed below:

- Earth and Groundwater
- Surface Water
- Plants and Wetlands
- Wildlife and Fish
- Land and Shoreline Use
- Socio-Economic
- Transportation
- Cultural and Historical Resources
- Visual

3.1 EARTH AND GROUNDWATER

AFFECTED ENVIRONMENT

Several sources of information regarding existing geologic conditions (topography, soils, groundwater, and associated hazards) that may be affected by the proposed East Lake Sammamish Interim Use Trail improvements were evaluated for this EA. The Geology and Technical Backup evaluation (Geology Appendix, King County, FEIS 2000a) includes maps of surficial geology and geological hazards, and a table summarizing the existing slope and geologic conditions for each trail segment.

King County identified two areas along the proposed Interim Use Trail alignment for collection of soil samples. Preliminary testing indicated the presence of diesel and heavy oil at one site, and the presence of heavy oil at the other. The testing did not quantify the concentration of these contaminants in the samples. Neither of these areas would be disturbed as part of construction activities for the Interim Use Trail. King County is developing a plan for more detailed testing of the soils in these areas prior to construction of the Master Plan trail.

See Appendix A for a detailed description of Affected Environment.

IMPACTS

Preferred Alternative

Approximately 7,100 cubic yards of gravel would be placed on the existing railbed as part of implementing the Preferred Alternative. Erosion and sedimentation impacts could occur from the cleaning and maintenance of ditches and culverts. Such potential impacts would be greatest along Segments 2 through 6, where the railbed is often at the toe of a cut, fill, or natural slope. Less erosion and sedimentation would occur along drainage ditches in Segments 1 and 7, where the project corridor is in flat-lying areas.

Minor erosion and sedimentation could occur during removal of remaining railroad ties, placement and grading of crushed rock trail surfacing, fence construction, bollard and signpost installation, and removal of hazard trees. These impacts would be minimized by use of erosion control measures such as mulching or hydro seeding, and by other measures described in the "Mitigation" section below.

Construction of the trail would not alter the potential for or impacts from debris flows. Construction of the Interim Use Trail would not require cutting into any slopes, and therefore would not reduce the stability of existing slopes.

Incidental leaks of oils, lubricants, and fuels from construction equipment could occur during construction of the Preferred Alternative. If not prevented, contained, or cleaned up, these leaks could result in contamination of soil and surface water. The volume of such leaks from any given piece of equipment would be minimal (less than a gallon), unless a major fuel or hydraulic system piping failure occurred. Impacts to groundwater are unlikely, due to the short duration of construction in a given segment.

With implementation of mitigation measures, construction-related impacts would not be significant.

Over the long term, any soil left exposed to rainfall and surface runoff after initial construction and subsequent maintenance could erode and cause increased siltation and sedimentation of surface waters. Measures to prevent soil exposure to rainfall (such as mulching and hydroseeding) would be taken. Long-term impacts to earth and groundwater from trail use are anticipated to be negligible. Groundwater discharge to the lake would not be affected since no modifications to surface drainage would be made. No significant impacts to groundwater quantity or quality are expected.

Use of hazardous materials during operation and maintenance of the Interim Use Trail is not anticipated. Vegetation control would be conducted with weed trimmers and mechanical mowers. Wood splinters from removed railroad ties do not present long-term hazardous material concerns due to the very low leachability of the wood preservatives contained in the ties. Therefore, there are no anticipated significant impacts to earth and groundwater from the operation and maintenance of the Preferred Alternative.

MITIGATION

Preferred Alternative

Erosion

Soil that is not disturbed during construction or maintenance activities would not require mitigation. During construction, erosion control best management practices (BMPs) would be implemented to reduce erosion in construction areas. Impacts from removing existing sediment from ditches and culverts can best be mitigated by use of the most current BMPs. BMPs include, but are not limited to:

- Scheduling construction activities for the most appropriate times of year, e.g., periods of low rainfall.
- Mulching ditches and slopes with straw or matting where accumulated slough is removed to reduce ditch infilling and short-term erosion; reseed or plant with vegetation to reduce long-term erosion and sloughing, thus reducing the future frequency of ditch and culvert cleaning.
- Choosing BMPs for site-specific characteristics, including soil gradation, ditch inclination, and slope angle and height.
- Isolating work areas, and managing and monitoring turbidity.

The application of these BMPs are described in the project's Technical Information Report (Parametrix 2001a), Stormwater Pollution Prevention Plan (SWPPP; Parametrix 2001b), and Temporary Sediment and Erosion Control and Construction Monitoring Plan (Parametrix 2001c), as well as the Regional Road Maintenance Endangered Species Act Program Guidelines (Regional Road Maintenance Technical Working Group 2000).

Siltation associated with placement and grading of crushed rock may be mitigated by use of silt fences to protect wet ditches and skillful earthwork to reduce the amount of material spilled into ditches. Silt-laden soils excavated during signpost, bollard, and fence installation would be removed from the site or spread in place and covered with mulch. Erosion that may occur from the removal of remaining railroad ties and hazard trees (Plants and Wetlands Section 3.3) would be mitigated by the placement of straw mulch as needed. The majority of these BMPs would be identified and their usage prescribed in the construction plans and specifications.

No soil disturbance would occur in areas with suspected contamination of diesel and heavy oil.

Hazardous Materials

Spill control and cleanup procedures for hazardous materials used during project construction is addressed in the Stormwater Pollution Prevention Plan (SWPPP) for the construction project. The SWPPP is required as a condition of the construction National Pollutant Discharge Elimination System (NPDES) permit for the project, and it includes BMPs for prevention, identification, reporting, clean-up and monitoring of any fluid leaks or spills that could impact the earth and groundwater. Compliance with the SWPPP would be monitored by King County or their designated representative.

3.2 SURFACE WATER

AFFECTED ENVIRONMENT

The East Lake Sammamish Interim Use Trail lies within four major watersheds: Bear Creek, Sammamish River, East Lake Sammamish, and Issaquah Creek, all of which are part of Water Resource Inventory Area (WRIA) 8: Cedar-Sammamish Basin. Most of the proposed trail would lie within the East Lake Sammamish Basin (Figures 3.2-1 and 3.2-2). Numerous perennial and intermittent creeks, seeps, and wetlands lie within the project area. Several lakes are located within the project area, and most of the trail would be located within 200 feet of the eastern shore of Lake Sammamish. Surface waters, including the hydrology, water quality, and floodplains associated with the major surface water features within the project area, are discussed in Appendix B. Wetlands and fisheries are discussed in Sections 3.3 and 3.4 of this document.

IMPACTS

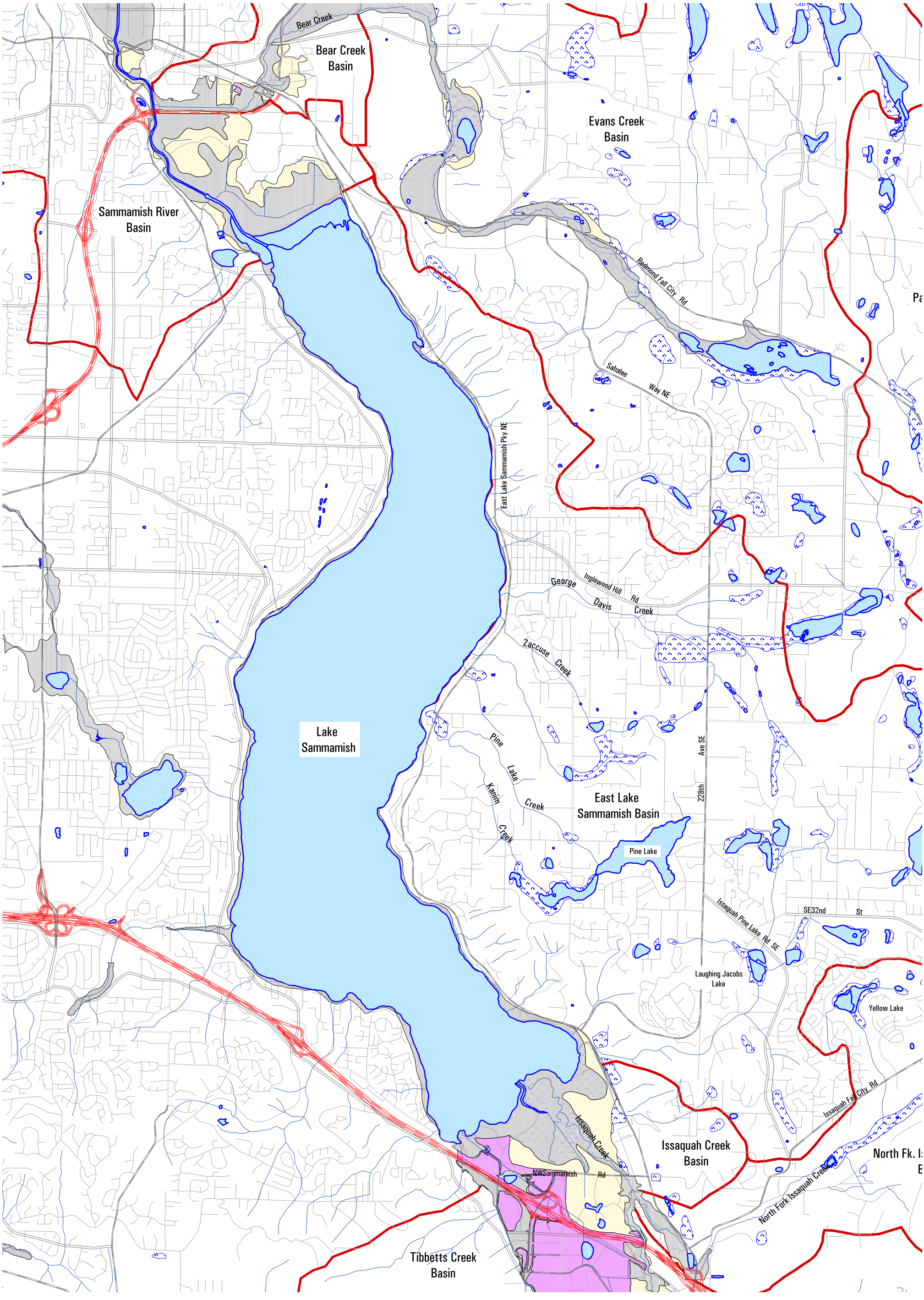
Preferred Alternative

Impacts to surface water associated with general construction activities would be similar along the entire trail length. All construction activities would be temporary and of relatively short duration in any one location, and with incorporation of mitigation measures, impacts would not be significant.

Gravel placement along the entire trail corridor for erosion control and creation of a level trail surface would be the main construction activity associated with the Interim Use Trail. Locations for trail construction staging areas have been identified and are limited to three areas at the south, north, and midsection of the corridor, where existing impervious area is wide enough to accommodate staging of equipment and or materials. No area will be expanded and no new disturbances will be created. Gravel placement could result in an increase in fine sediment, which could temporarily impact water quality. Gravel placement could also increase erosion along ditches, wetlands, or streams adjacent to the existing railbed, if heavy machinery used to haul and spread the gravel were to drive on the shoulder. Heavy equipment required for construction activities could potentially impact water quality by increasing the potential for spills (such as oil or gasoline).

Resource protection includes construction of fences near streams and wetlands. Due to vegetation removal and earthwork, sedimentation and erosion would be potential impacts associated with construction of these fences (see Section 3.1, Earth and Groundwater). Excavation for fence posts would be short-term and localized. Fence posts would generally be placed in flat locations, reducing the potential for erosion and sedimentation.

Ditch and culvert maintenance would occur during both the construction and long-term operational phases of the trail. This maintenance would require localized vegetation removal as needed to access the site and manual cleaning of ditches and culverts using shovels and specialized tools. These activities would potentially result in short-term water quality impacts. The Preferred Alternative would likely restore local drainage patterns and reduce local flooding problems by maintaining or restoring the historic level of function in these ditches and pipes.



SOURCE: King County, 1999

Parametrix, Inc. Date: 01/21/00 File name: basemap.apr

500.0 0 500.0 1000.0 1500.0 2000.0 Feet

Scale 1" : 3500'

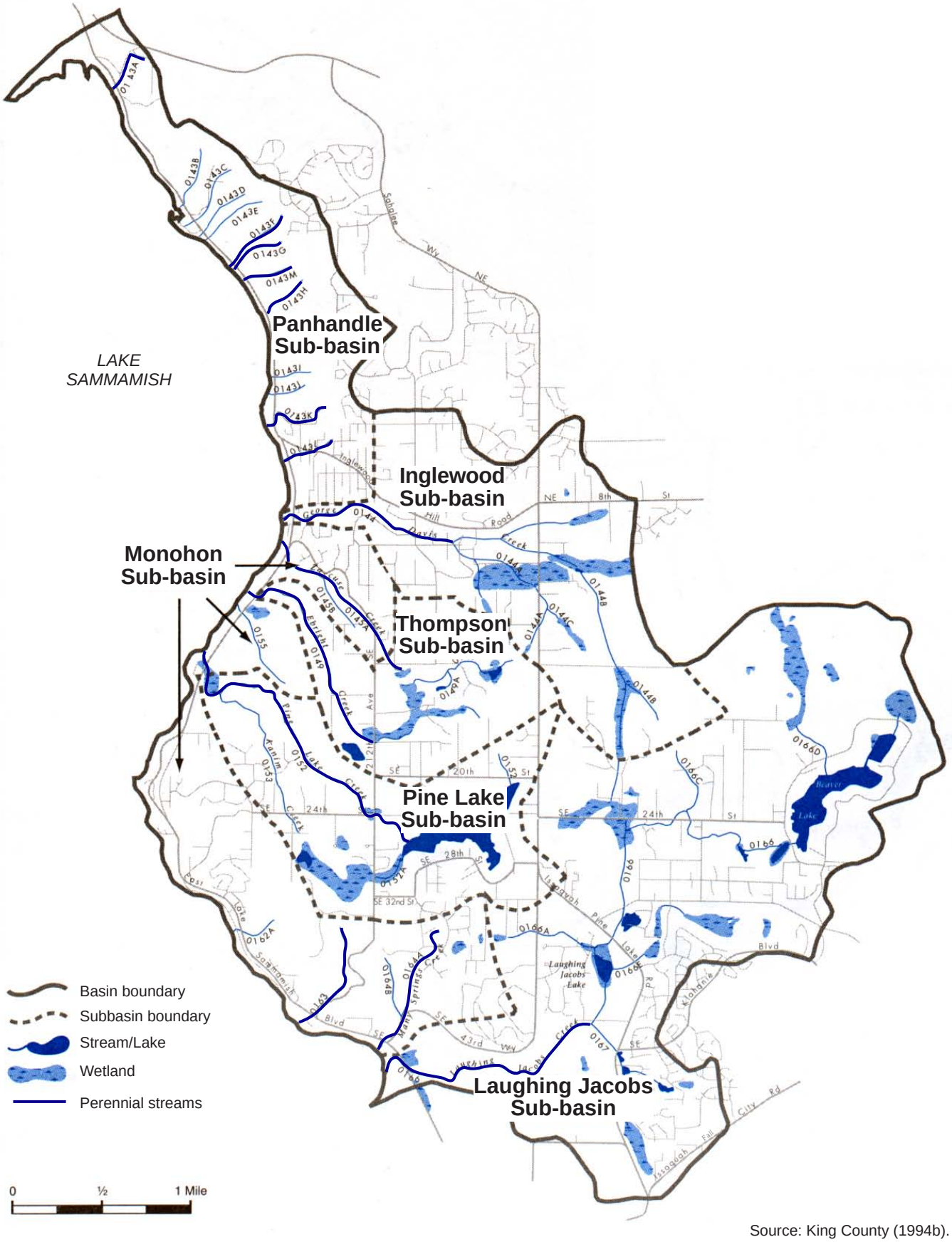
N

Water Body
Wetlands
Drainage Basins

Floodplain
100 Year
500 Year
Over 500 Year

Water Courses
Trail Right Of Way

Figure 3.2-1
Project Area
East Lake Sammamish Trail



Source: King County (1994b).

Figure 3.2-2
Water Resources
East Lake Sammamish Basin

Only existing ditches and culverts would be maintained; impacts are expected to be non-significant and isolated. King County is proposing to provide routine maintenance of ditches and culverts along the corridor, which would primarily include removing sediment from culverts and ditches. This work would not be performed without the required permits. Mitigation for potential impacts associated with this work would be addressed under the permit applications. Impacts are expected to be non-significant and isolated.

Long-term use of the Interim Use Trail is not likely to affect the hydrology of any of the streams or Lake Sammamish or affect identified floodplains. Impervious area and topography would not be altered from current conditions.

Hydrologic impacts to streams in the project area are not expected because the imperviousness of the trail would not change under interim use. Hydrologic models do not distinguish between types of gravel in their runoff calculations. Since the Preferred Alternative would simply involve adding gravel to a gravel surface, the trail surface will hydrologically perform the same way as the existing surface. Gravel and rock placed on a portion of the railbed during rail salvage did not effectively change the hydrology or imperviousness of the railbed from its condition prior to salvage. Furthermore, no additional impervious surfaces would be created to provide parking. It is possible that additional impervious surfaces would be added in conjunction with access points. However, these areas are expected to be minimal and have a negligible impact on hydrology. Therefore, the Preferred Alternative is not expected to create additional runoff.

Implementation of the Interim Use Trail would require partial filling of wetlands that occur on the railbed surface (see Plants and Wetlands Section 3.3). The Preferred Alternative would result in the filling or partial filling of five such wetlands: Wetlands 31B, 30B, 29A, 28A, and 16A. Based on wetlands evaluations conducted as part of the SEPA EIS, Wetlands 31B, 30B, 29A, and 28A do not provide significant flood storage, and would not attenuate peak flows. Impacts would not be significant. Wetland 16A does provide a small volume of storage. However, this wetland drains to Lake Sammamish through a pipe, and is not connected via surface water to a stream. Therefore, impacts would not be significant because fill in Wetland 16A would not alter peak flows in streams along the trail corridor.

The Interim Use Trail would not be subjected to vehicular use except for periodic maintenance. Therefore, it would not be a source of heavy metals or hydrocarbons. Because it would not be fertilized, the trail would also not be a source of nutrients such as phosphorus, which is a pollutant of concern in the Lake Sammamish Basin. Based on these facts and definitions of pollutant-generating surfaces (1998, King County Surface Water Design Manual)[1], it is assumed that the Interim Use Trail would be considered non-pollutant-generating and impacts would not be significant. Increased use by bicycles and dogs (which could be considered potential sources of pollutants) would not result in significant and measurable water quality impacts. Potential increases in the amount of dog feces could be an additional source of fecal coliform and nutrients to the basin, but with incorporation of mitigation measures, impacts would not be significant.

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[1] Pollution-Generating Impervious Surfaces include "those (surfaces) which are subject to vehicular use or storage of erodible or leachable materials, wastes, or chemicals, and which receive direct rainfall or the run-on or flow in of rainfall." Pollution-Generating Pervious Surfaces include (but are not limited to) "lawn and landscaped areas of residential or commercial sites, golf courses, parks and sports fields."

Increased bicycle and pedestrian use of the railroad corridor could increase erosion of the trail shoulder (i.e., sloughing of gravel) near ditches, wetlands, and streams if these areas are not stabilized prior to use. Erosion could result in sediment being conveyed to streams, which could temporarily degrade water quality. This could occur during storm events when fine sediment could flush from the trail. In addition, unauthorized access points to the trail could trigger local erosion and increase the amount of sediment being conveyed to streams. However, with incorporation of mitigation measures, impacts would not be significant.

Increased vehicular traffic due to trail users along East Lake Sammamish Parkway and other roads near the trail could increase pollutants, such as hydrocarbons and heavy metals, found in local road runoff. Increased traffic from trail users is minor, and road runoff would be treated as part of the roadways' drainage systems. Therefore, no additional water quality mitigation is proposed and impacts would not be significant.

Implementation of resource protection measures would not result in any significant long-term impacts to streams, and may minimize other impacts to the streams adjacent to the Interim Use Trail.

Approximately 6,800 linear feet of the existing trail right-of-way are located within the East Lake Sammamish 100-year FEMA floodplain and 620 linear feet within the North Fork Issaquah Creek 100-year FEMA floodplain. Implementation of the Preferred Alternative would not change floodplain characteristics from the current condition. Impacts would not be significant.

Historic flooding/drainage complaints in the project vicinity were examined and only two were determined to be related to ditches or pipes associated with the existing railbed. Both of these complaints are related to maintenance of existing (historic) drainage patterns, not capacity. Maintenance work was performed at both of the complaint locations in October 2001. Sediment was removed and the areas were stabilized to improve drainage through the problem areas. King County will continue to perform regular maintenance of culverts and ditches along the trail as part of their railbanking obligations.

MITIGATION

Preferred Alternative

Identified impacts would not be significant following implementation of mitigation actions. The project will be constructed in compliance with King County Surface Water Design Manual core requirements, illustrated in Table 3.2-1. In addition to complying with the required mitigation associated with permits and approvals required by the cities of Issaquah, Redmond, and Sammamish, as well as King County, and Washington State Departments of Ecology and Fish and Wildlife. Construction BMPs outlined in the *King County Surface Water Design Manual* would be implemented at all construction sites (Table 3.2-2).

Table 3.2-1. 1998 King County Surface Water Design Manual Core Requirements.

King County Core Requirements		Intent
#1	Discharge at Natural Location	To prevent surface and stormwater runoff from creating an adverse impact to downstream properties or drainage systems.
#2	Offsite Analysis	To identify and evaluate offsite drainage problems that could be created or aggravated by the proposed project.
#3	Flow Control	To protect downstream properties and natural resources from increases in peak, duration, and volume of runoff generated by the proposed project.
#4	Conveyance Systems	To ensure proper design and construction of conveyance systems.
#5	Erosion and Sediment Control	To prevent transport of sediment to streams, lakes, wetlands, and drainage systems.
#6	Maintenance and Operations	To ensure that responsibility for maintaining and operating drainage facilities is clearly defined.
#7	Financial Guarantees and Liability	To ensure financial guarantees are posted to sufficiently cover costs of correcting substandard drainage facilities.
#8	Water Quality	To ensure that efficient, cost-effective water quality treatment is provided to the targeted treatment level to meet the resource protection needs of specific areas.

Source: King County, 1998b.

Table 3.2-2 King County Recommended Temporary Erosion and Sediment Control BMPs.

Category	Applicable BMPs
Temporary Cover Practices	Temporary seeding; Straw mulch; Bonded fiber matrices; Plastic covering.
Permanent Cover Practices	Preserving natural vegetation; Buffer zones; Permanent seeding and planting.
Structural Erosion Control BMPs	Stabilized construction entrance; Tire wash; Construction road stabilization; Dust control; Interceptor dike and swale; Check dams.
Sediment Retention	Filter fence; Storm drain inlet protection; Sedimentation basins.

Source: King County (1998b).

Additional mitigation would be provided to ensure that construction, maintenance, and use of the trail does not result in any significant long-term impacts to surface water resources. These additional mitigation methods include:

- Stabilizing the trail shoulder in areas adjacent to streams, wetlands, and ditches;
- Conducting maintenance investigations of the trail corridor after large storm events and on a routine schedule to identify eroding ditches and unauthorized access points;

- Replanting native riparian vegetation along stream corridors to reduce bank erosion and enhance habitat;
- Installing and maintaining dog waste collection stations;
- Restoring function to the existing storm drainage system for the entire stream corridor;
- Timing maintenance periods to minimize impacts to fish;
- Installation of geotextile fabric in ditches with disturbed soil; and
- The edges of the trail near salmon bearing streams could be lined with 4-inch high geotextile fabric and backfilled with washed rock. The gravel mix used for the trail surface (containing fine sediment) would then be separated from the stream and ditches by the geotextile fabric and washed rock.

3.3 PLANTS AND WETLANDS

AFFECTED ENVIRONMENT

Plants

Vegetation information is based primarily on a review of data provided by resource agencies, and site visits conducted throughout 1999 and the first three months of 2000. Vegetation communities (wildlife cover types) in the project area are shown on Figures 3-A, 3-B, 3-C, 3-D, 3-E, 3-F, 3-G, 3-H, 3-I, and 3-J, located at the end of this Chapter.

Existing vegetation was classified into the following communities: urban matrix, deciduous forest, coniferous forest, and wetland vegetation (Table 3.3-1). The urban matrix is the predominant plant community in the corridor, and consists of a mosaic of small patches of native plants, ornamental trees, shrubs, and mowed turf, and areas of invasive and weedy species. Deciduous and coniferous forest, as well as some of the wetland plant communities, are comprised primarily of native species. Some non-native weedy species are present in the communities. Reed canarygrass and/or Himalayan blackberry dominate some of the wetland plant communities. Individual plant species identified in the project corridor are listed in the Plant Species Appendix (King County, FEIS, 2000a).

Wetlands

Wetlands are defined as those areas that are inundated or saturated long enough during the growing season to develop anaerobic conditions in the upper portion of the soil, which results in the development of wetland vegetation and hydric soils. Parametrix, Inc. staff identified wetlands in April of 1999, and delineated vegetated wetlands during November and December 1999, and January and February 2000. Wetland delineation methods were based on the *Wetland Delineation Manual* (Environmental Laboratory, 1987) and the *Washington State Wetlands Identification and Delineation Manual* (Ecology, 1997).

Table 3.3-1. Typical Plant Species Present in the Plant Communities in the Corridor

Vegetation Community	Frequency[1]	Typical Species	Common Name	Scientific Name
Landscaped	70%	Overstory	Ornamental trees	
		Understory	Mixed turf grasses Ornamental shrubs	
Coniferous Forest	5%	Overstory	Douglas-fir Western redcedar Red alder	*Pseudotsuga menziesii* *Thuja plicata* *Alnus rubra*
		Understory	Salal Swordfern Evergreen huckleberry Indian plum Vine maple	*Gaultheria shallon* *Polystichum munitum* *Vaccinium ovatum* *Oemleria cerasiformis* *Acer circinatum*
Deciduous Forest	5%	Overstory	Big leaf maple Red alder	*Acer macrophyllum* *Alnus rubra*
		Understory	Beaked hazelnut Swordfern Salal Common snowberry Himalayan blackberry Oregon grape	*Corylus cornuta* *Polystichum munitum* *Gaultheria shallon* *Symphoricarpos albus* *Rubus discolor* *Mahonia aquifolium*
Wetland	10%	Forested	Black cottonwood Oregon ash Pacific ninebark	*Populus balsamifera* *Fraxinus latifolia* *Physocarpus capitatus*
		Shrub	Pacific willow Sitka willow Himalayan blackberry	*Salix lucida* *Salix sitchensis* *Rubus discolor*
		Emergent	Reed canarygrass Himalayan blackberry Soft rush Cattail	*Phalaris arundinacea* *Rubus discolor* *Juncus effusus* *Typha latifolia*
Ballast	10%	Weedy grasses and forbs	Bentgrass Reed canarygrass Danelion Nipplewort Shotweed Himalayan blackberry	*Agrostis* sp. *Phalaris arundinacea* *Taraxacum officinale* *Lapsana Cemmunis* *Cardamine olgospermum* *Rubus discolor*

Wetlands were classified according to the U.S. Fish and Wildlife Service *Classification of Wetlands and Deep Water Habitats of the United States* (Cowardin et al., 1979). Boundaries of palustrine (vegetated) wetlands occurring in the project area were delineated within the corridor, or within 25 feet of the top edge of the railbed. Lacustrine wetlands occur along the Lake Sammamish shoreline adjacent to the corridor in several locations. Boundaries of lacustrine wetlands were not delineated and are assumed to occur at the shoreline waterwards until water depths are greater than 6.6 feet. Additional detailed information is located in the Wetland Appendix, *East Lake Sammamish Trail Wetlands Report* (King County, FEIS, 2000a). Wetland functional assessments were conducted for vegetated wetlands based on the presence of indicators and professional judgment. These assessments focused on hydrological and biological functions typically performed by wetlands (Brinson, 1993; Reimold, 1994; Reppert, et al., 1979).

Threatened, Endangered, or Sensitive Plant Species

Species with Federal Status

Threatened, endangered, or sensitive plant species are usually sensitive to disturbance. Because the corridor and the project vicinity are largely urbanized, there is a low probability for the presence of threatened, endangered, or sensitive species. The Washington State Department of Natural Resources (DNR) Natural Heritage Program (NHP) lists plant species considered to be federally threatened, endangered, a candidate for listing, or sensitive. No federally listed plant species are known to be in the project area or vicinity (see Plant Species Appendix, King County, FEIS, 2000a).

Species with State Status

The NHP has also developed a list of plant species considered to be threatened, endangered, or sensitive within the State of Washington (DNR, 2000). Data from the NHP indicates that a state sensitive plant species, shining flatsedge (*Cyperus bipartitus = C. rivularis*), was reported growing approximately 0.02 mile from the corridor in the vicinity of Lake Sammamish State Park. This small, annual flatsedge occurs on sandbars adjacent to fresh water lakes and streams. The species was not observed to occur in the trail corridor.

See Appendix C for a detailed description of Plants and Wetlands in the trail corridor.

IMPACTS

Preferred Alternative

Plants

Because the Interim Use Trail would be built on an existing structure, no significant impacts to plants are expected. Construction impacts of the Interim Use Trail would be limited to plant removal for fence construction and safe trail operation. Culvert maintenance and gravel installation could result in non-significant impacts to small amounts of vegetation.

Impacts to plants to improve trail safety would include removal of hazard trees and reduction of vegetation to maintain sight lines at intersections and road or driveway crossings. Several hazard trees have been identified along the route (see Table B-B1 of the Geology Appendix, King County, FEIS, 2000a). Vegetation that blocks sight lines at road and driveway crossings would be removed or thinned to increase visibility for trail users and vehicles.

During fence installation, all plants within the fence line would be removed to provide a clear fence line. Impacts along the fence line would be temporary and not significant because plants would recolonize within several growing seasons following fence installation.

Currently, plants do not grow on the top of the railbed to any great extent. However, those plants that do exist on the railbed would be impacted by gravel placement. Those plants are typically low stature, weedy, annual forbs and grasses that are limited in extent. They do not provide measurable amounts of protection, food, or forage to wildlife, and they do not provide other appreciable ecological functions. Impacts would not be significant.

No adverse impacts to plants in the corridor are likely to result from long-term trail use. Because the trail would be located on an existing structure in a largely urban environment, long-term use would not result in loss of plant species diversity or reduced plant structural diversity in the corridor. Non-significant impacts could result from maintenance of fences and sight lines at crossings, or from trampling by humans or pets.

Wetlands

Permanent, direct impacts to wetlands through filling would be limited to wetlands that extend onto the railbed surface, because no new railbed would be built, and the existing railbed would not be widened. Other construction impacts could include accidental spilling of construction materials, temporary noise disturbance to wetland wildlife, and sedimentation and vegetation disturbance during fence installation. No significant wetland or wetland buffer impacts are anticipated.

Portions of five wetlands are located on the railbed and would be subject to filling from construction (See Figures 3-A, 3-B, 3-C, 3-D, 3-E, 3-F, 3-G, 3-H, 3-I, 3-J, and the GIS maps at the end of this Chapter). The total area of filling is approximately 0.087 acre (see Table 3.3-2). All five affected wetlands are located in the City of Sammamish, and two of these are less than 2,500 square feet and are exempt from sensitive area regulations. The proposed wetland impacts would be regulated by the U.S. Army Corps of Engineers (ACOE) under the Clean Water Act. The City of Sammamish would also regulate impacts to wetlands greater than 2,500 square feet in total area under the local sensitive areas code.

The areas of impacted wetland are poorly vegetated and do not have vegetated or functioning buffers because they are located on the railbed. The wetlands are each of limited size, and thus they do not provide important biologic or hydrologic functions (refer to Wetland Appendix, King County, FEIS, 2000a). No measurable change to wetland function would occur through filling of these areas.

Accidental surfacing material (e.g., gravel) spills from the top of the railbed during trail construction could result in burial of wetland vegetation and soils. The use of BMPs and careful gravel placement during construction would reduce the risk of spilling. No significant impacts to wetlands or their buffers are expected with the incorporation of mitigation measures.

Table 3.3-2. Summary of Potential Wetland Impacts

Wetland	Sub-basin	Total Wetland Area (acre)	Wetland Rating	Impacted Area (Top of Rail Bed) (acre)
				Preferred Alternative
31B	Panhandle	0.024	Not rated[1]	0.019
30B	Panhandle	0.380	Class 3	0.017
29A	Panhandle	0.030	Not rated	0.011
28A	Panhandle	0.153	Class 3	0.012
16A	Monohon	0.068	Class 3	0.028
Total				0.087

[1] Wetland area is smaller than 2,500 square feet and is not rated according to Sammamish/King County Sensitive Area Ordinance.

Culvert maintenance activities generally are limited to periodic clearing of sediments and debris and do not usually result in direct disturbance to wetlands. However, a small amount of sediment could be deposited in wetlands as a result of culvert maintenance. Small amounts of vegetation in wetlands or wetland buffers may be cleared to maintain culverts. These activities would result in minor alterations of wildlife habitat in the affected wetlands. No significant impacts are expected with the incorporation of mitigation measures.

Long-term use of the trail would not appreciably reduce the existing wetland area, increase habitat fragmentation, increase risks of introduced plant or animal species, or directly result in substantial changes to wetland or wetland buffer functions. Resource protection measures including fencing and signage would prevent human intrusion. Non-significant indirect impacts to wetland wildlife could occur including increased human and pet disturbance and overgrowth of invasive plant species in wetlands or wetland buffers.

Where the corridor crosses through the wetlands of Marymoor Park and Lake Sammamish State Park, it is adjacent to East Lake Sammamish Parkway. Direct impacts related to trail use potentially would include increased human and pet trampling of wetland plants and disturbance to soil; these impacts would not be significant.

Fencing may promote the formation of Himalayan blackberry hedges in wetlands or wetland buffers because this species is currently established in the area and would grow well on the physical support provided by the fences. The proposed fencing would be installed along the railbed base where, along most of the corridor, reed canarygrass currently grows. Specific impacts of Himalayan blackberry on wetland wildlife and other wetland functions are contingent on the extent of the blackberry colonization, and on the surrounding vegetation composition and other local conditions, but are not expected to be significant with anticipated vegetation management measures.

Threatened, Endangered, or Sensitive Plant Species

No threatened, endangered, or sensitive plant species are located within the trail corridor. No short- or long-term impacts to threatened, endangered, and sensitive plant species are anticipated.

MITIGATION

Preferred Alternative

Plants

Under the Preferred Alternative, mitigation for construction impacts would consist of avoiding and minimizing potential impacts wherever possible. Mitigation also includes the use of construction BMPs and a vegetation management plan that would meet the requirements of all resource agencies. This plan would be implemented to specify when plant removal is needed, how areas would be replanted or re-seeded if necessary, and monitoring requirements.

Impacts to plants in the corridor from long-term use of the trail by humans or pets would be mitigated by several actions. Primary mitigation for plant impacts would be specified in the

vegetation management plan. The goal of the management plan is to maintain and monitor native plant communities in the corridor, provide a safe trail environment, and control invasive species. Also, the plan would identify when plant replacement is needed, specify plant species, numbers, and locations for native plantings, and stipulate monitoring requirements. The plan would follow regulations and incorporate guidelines for native plant management as stipulated by King County. The plan would include manual, mechanical, biological, cultural, and chemical methods. This strategy is designed to minimize potential negative impacts from vegetation management in wetland and riparian buffers, wetlands, water bodies, steep slopes, deciduous forests, and the urban matrix.

Monitoring, documentation, and implementation would be the responsibility of King County, and would be accomplished by County staff or contract.

Fences would limit access to sensitive areas, and to some ornamental plantings and areas of mowed turf, reducing the risk of trampling impacts from humans and pets.

Wetlands

In accordance with local regulations, unavoidable alteration of Class 3 wetlands and wetland buffer would be mitigated by replacement or enhancement using a 1:1 ratio (on-site and in same sub-basin).

A wetland mitigation site has been identified. This area was chosen for enhancement because part of this wetland will be impacted by the proposed trail and it is primarily located within the right-of-way owned by King County (i.e., no property acquisition is required). Enhancement of this area would provide a 4-to-1 wetland compensation ratio for permanent wetland impacts (0.087 acre), thus exceeding the required mitigation ratio. The conceptual mitigation plan is currently under review by the local jurisdiction.

Temporary impacts to wetlands during construction would be minimized through the use of BMPs. These would include performing railbed protection and fence installation during the driest months, and using hand tools to minimize the risk of disturbed soil or sediments entering the wetland. To minimize the disturbance to vegetation, fencing would be located to avoid removal of trees, shrubs and herbaceous plants, wherever possible. To avoid accidental spillage of gravel into wetlands, careful placement and grading of gravel and the use of erosion and sediment BMPs are recommended.

Ongoing maintenance to keep the corridor clear of nuisance vegetation would be conducted.

3.4 WILDLIFE AND FISH

This section describes cover types and associated wildlife in the vicinity, and the occurrence of threatened, endangered, and other species of state and federal concern.

AFFECTED ENVIRONMENT

Wildlife

The project area passes through four main vegetation cover types: urban matrix, deciduous tree cover (both upland and riparian), coniferous tree cover (upland only), and wetlands (see Figures 3-A, 3-B, 3-C, 3-D, 3-E, 3-F, 3-G, 3-H, 3-I, 3-J, and the GIS maps at end of this Chapter). The Wildlife Appendix (King County, FEIS, 2000a) provides a list of all wildlife species expected in the project area vicinity.

Threatened and Endangered Species

Species with federal status that are likely to use the project vicinity include bald eagle, peregrine falcon, and Western pond turtle. Species with state or local status that are likely to use the project vicinity include purple martin, great blue heron, pileated woodpecker, and red-tailed hawk. Some of these species have been documented in the project area. Additional information is provided in the Wildlife Appendix of the SEPA EIS (King County, FEIS, 2000a) as well as the Biological Evaluation (King County, 2000b).

Threatened and endangered fish that could be affected by the project include chinook salmon and bull trout. Other fish species with federal status that occur within the project vicinity include coho salmon, which are a candidate for listing, and Pacific and river lamprey, which are federal species of concern. No state sensitive, threatened, or endangered fish species occur within the project area. State Priority Species that may occur in the project vicinity include chum, sockeye, and kokanee salmon, rainbow/steelhead trout, coastal cutthroat trout, white sturgeon (*Acipenser transmontanus*), largemouth bass, smallmouth bass, and longfin smelt (*Spirinchus thaleichthys*).

Fish

Lake Sammamish serves as a rearing environment and migratory pathway for both resident and anadromous salmonids, with chinook (*Oncorhynchus tshawytscha*), coho *(O. kisutch*), sockeye, and kokanee salmon (both *O. nerka)*, steelhead (*O. mykiss*), and coastal cutthroat trout (*O. clarki*) found in the lake and its tributaries (King County, 1990b; Pfeifer, 1992). Other than one unconfirmed anecdotal account, there is no documentation of bull trout (*Salvelinus confluentus*) presence in the Lake Sammamish basin. Lake Sammamish also contains a diverse population of resident non-salmonid species (see Table G-1 in Fish Appendix, King County, FEIS, 2000a) including largemouth bass (*Micropterus salmoides*), smallmouth bass (*M. dolomieu*), yellow perch (*Perca flavesens*), brown bullhead (*Ameiurus nebulosus*), and black crappie (*Pomoxis nigromaculatus*) (King County, 1990b). Sub-populations of Lake Washington sockeye and kokanee salmon spawn along the shorelines of Lake Sammamish. Although actual spawner numbers are unknown, shore spawning populations have been declining in recent years. Historically, all of the east shore south of Weber Point supported beach-spawning sockeye salmon (Fisher, personal communication, 2000).

Approximately 60 streams and smaller drainages (i.e., those with visible surface flow) are crossed by the 10.6 mile project corridor. With few exceptions (e.g., North Fork Issaquah

Creek), streams which flow into Lake Sammamish pass underneath East Lake Sammamish Parkway through one or more culverts (both concrete and corrugated metal pipe [CMP]) upstream of the railbed crossing. All but the largest of the streams also pass through concrete or CMP culverts under the former railbed.

The larger streams crossed by the project corridor originate from larger wetland areas or small lakes on the adjacent Sammamish Plateau. At least nine of these larger streams are known to provide habitat below barriers for anadromous and/or resident salmonid species including coho, fall chinook, and sockeye/kokanee salmon, rainbow trout, and cutthroat trout. These salmonid-bearing streams include North Fork Issaquah, Many Springs, Laughing Jacobs, Pine Lake, Ebright, Zaccuse, George Davis, and Perennial Stream 0163. Although other streams within the study area also supported salmonid populations at one time, shoreline development, road and railroad construction, and other activities destroyed fish habitat and created impassable barriers to upstream passage.

Other fish species likely to be present in some of the approximately 60 streams, depending on site-specific habitat conditions, include threespine stickleback (*Gasterosteus aculeatus*), speckled dace (*Rhinichthys osculus*), sculpins (*Cottus* spp.), or brook lamprey (*Lampetra richardsoni*).

IMPACTS

Preferred Alternative

Wildlife

Construction of an Interim Use Trail could impact wildlife through noise and visual disturbance. Where construction activities (i.e., grading and dumping, spreading, and leveling of gravel) occur, wildlife sensitive to disturbance could be temporarily displaced to surrounding areas (Table 3.4-1). The time period of construction in any given segment of the trail would be short (up to two weeks), and most wildlife would be expected to return to their original use areas following construction. Wildlife that use portions of the project corridor where human presence and activity is currently less common (e.g., Segment 2) are expected to show a greater response to trail construction than wildlife in other portions of the project corridor where human disturbance is currently more common (e.g., Segment 1 and Segments 3 through 7). However, with the incorporation of mitigation measures, impacts are not expected to be significant.

Long-term interim trail use could impact wildlife through noise and visual disturbance, harassment from dogs, restricted access due to fencing, and habitat degradation through trampling of vegetation. Most of the railbed vicinity consists of developed areas with homes, light-industrial buildings, and paved roads. Wildlife that use these areas have a demonstrated tolerance for human activities and domestic animals, and trail use would likely represent a negligible increase in visual and noise disturbance, and harassment by dogs. Urban generalists, such as house sparrows, house finches, song sparrows, and robins would remain common throughout the project area. Impacts would not be significant.

Table 3.4-1. Construction and Interim Trail Use Effects on Wildlife

Alternative	Action		
	Trail Construction	**Interim Trail Use**	**Resource Protection**
Preferred Alternative	General Wildlife: Short-term displacement of some wildlife, especially in Segment 2.	General Wildlife: Minor disturbance to wildlife, especially in Segment 2. Some wildlife may avoid the immediate trail vicinity. For larger mammals, minor restriction in access to sensitive habitats due to fencing.	Fencing and signage of streams and wetlands.
	Threatened and Endangered (T & E) Species: No impact to existing bald eagle nest site, great blue heron rookery, or likely red-tailed hawk nest site. Potential short-term displacement of nesting and/or foraging pileated woodpeckers to surrounding areas. No impact to other sensitive species.	T & E Species: No impact to existing bald eagle nest site, great blue heron rookery, or likely red-tailed hawk nest site. Potential long-term displacement of nesting and/or foraging pileated woodpeckers to surrounding areas. No impact to other sensitive species.	Avoidance during construction

Homes and light industrial buildings are not present along most of the northern part of the railbed (i.e., Segment 2). The main disturbance in this area is the traffic from East Lake Sammamish Parkway. Interim trail use in the area could result in some visual and noise disturbance to wildlife, as well as harassment from dogs. Birds that nest adjacent to the railbed in this area could be displaced to areas farther from the trail, and some small mammals may also move to areas farther from the trail. Disturbance effects to larger mammals, such as deer, coyotes, and fox, may be moderated by the fact that these animals are active mostly in early morning, evening, and nighttime, when trail use is expected to be less intensive. Impacts are not expected to be significant.

Fencing along portions of the trail could inhibit deer, coyote, and fox access to Lake Sammamish and other sensitive habitats. However, because fencing would be intermittent, it would not entirely prohibit these animals from using these areas and would result in non-significant impacts. Fencing has the beneficial effect of restricting trail users from adjacent sensitive habitats.

Threatened and Endangered Wildlife Species

The existing great blue heron rookeries in Lake Sammamish State Park and along the Sammamish River and the bald eagle nest associated with the Lake Sammamish territory are all at least 1,320 feet from the trail. The bald eagle nest is not within line-of-sight of the trail. However, the nest used by the Marymoor Park bald eagles in 2000 is within approximately 660 feet of the trail and is within line of sight when deciduous trees are not leafed out.

The Washington Department of Fish and Wildlife (WDFW, 1999b) recommends a 820- to 984-foot buffer around great blue heron rookeries, and the *King County Surface Water Design Manual*, Special District Overlay, SO-200 requires a 660-foot buffer around rookeries. Standard

buffer distances are not given by WDFW for bald eagles, but the Pacific Bald Eagle Recovery Plan recommends a buffer of 0.25 mile (1,320 feet) for screened nests and 0.50 mile (2,640 feet) for visible nests from the following activities: camping, fireworks, timber harvest, and other disturbing activities (USFWS, 1986). Given the distances of the heron rookeries and the Lake Sammamish eagle nest from the trail and the type of human activities that are already taking place in the trail vicinity, disturbance associated with trail construction and use is not expected to affect these nest sites and impacts would not be significant.

Although the Marymoor Park eagle nest is relatively near the trail, the eagle pair using this nest has demonstrated tolerance to human activity. The previous nest location for this pair was immediately adjacent to the model airplane field at Marymoor Park, an area which receives heavy use by recreationists. Given their history, it is expected that the Marymoor Park bald eagle pair would not be appreciably affected by trail construction and use. WDFW indicated that the distance of the existing nest from the proposed trail should be adequate to protect the nest site from potential trail construction and use impacts (S. Negre, personal communication). Impacts are not expected to be significant.

Other sensitive species likely or known to occur in the trail vicinity include peregrine falcons, western pond turtles, purple martins, pileated woodpeckers, and red-tailed hawks. Because peregrine falcons are infrequent visitors to the area even during migration, trail construction and use is expected to have no effect on the species. Western pond turtles also are not likely to be affected by the project. Suitable habitat for this species is not present adjacent to the trail; consequently, pond turtle habitat would not be impacted by the Interim Use Trail. Disturbance to nesting purple martins is not expected from trail construction or interim use, because the nesting area for the species is about 650 feet from the trail. Effects to pileated woodpeckers may occur from trail construction and interim use. These birds have been observed foraging in areas immediately adjacent to the trail, and they may be nesting in the area as well. Trail construction and use may cause nesting and foraging pileated woodpeckers to be displaced to areas farther from the trail. However, these impacts are not expected to be significant, because the areas of concern are relatively small, and habitat is available outside the immediate vicinity of the trail. Red-tailed hawks are known to use the grassy wetland in Lake Sammamish State Park (wetland 4A through E) and the northern part of the forested wetland in Marymoor Park (wetland 34A through D) (see Wetland Appendix, King County, FEIS, 2000a). The raptor nest, likely a red-tailed hawk nest, was located in the Marymoor Park wetland in 2000 and observations indicate that the nest was active in 1999; bald eagles used this nest site in spring 2000. Due to the distance from the trail (approximately 630 feet), and apparent intermittent use by red-tailed hawks, no significant impacts are expected as a result of construction or use of the proposed Interim Use Trail.

Fish

Impacts to freshwater fish resources resulting from construction of the Interim Use Trail would be those associated with the project corridor stream crossings. There are minor differences in specific impact details from one stream to the next, depending on site-specific conditions. Potential construction impacts to fish-bearing streams that would be crossed under this alternative are listed in Table 3.4-2. Sedimentation impacts to crossed streambeds would be limited to sediment that potentially could be generated by: 1) laying of the new gravel/crushed

rock trail surface; 2) hole excavation related to fencing, signposts, and bollards; 3) sloughing or eroding railbed material; and 4) ditch and culvert sediment removal. With incorporation of mitigation measures, no significant impacts are expected.

Introduction of fine sediments through erosion and runoff to the streams can reduce the suitability of spawning gravels by filling gravel interstices, thereby restricting intragravel water flow and associated dissolved oxygen levels. Impacts would be greatest in stream reaches inhabited by salmonids during critical spawning and/or rearing periods, and excessive fine sediment could also diminish abundance and diversity of streambed invertebrate (fish food) production. Unavoidable or uncontrolled sediment inputs of streambed gravels would affect future suitability for fish spawning unless fall/winter flows flush sediments introduced during the construction period. Implementation of the recommended mitigation and BMPs for erosion control should minimize and mitigate potential adverse impacts to fish, and reduce impacts to a level of non-significance.

Table 3.4-2 Potential Construction and Operational Impacts of the Preferred Alternative Common to all Fish-Bearing Stream Crossings

Activity	Potential Impacts of Construction and Operation					Potential Mitigation				
	Short term increase in sediment	Fish disturbance, Noise, Vibration, and Pets	Bank and vegetation damage	Reduce sedimentation	Improve fish habitat	Use of erosion and sediment control BMPs	Careful placement and grading of crushed rock/gravel	Prohibit access to channel and banks; place sign at creek crossings	Restore banks and replant	Avoid instream work; perform work in compliance with HPA
Construction										
Trail resurfacing	X	X	X			X	X			
Gully repair and railbed shoring				X	X				X	X
Increased human activity	X	X	X					X		
Operational										
Ditch cleaning and maintenance	X	X	X							
Trail surface maintenance	X	X	X			X	X			
Increased human activity		X	X					X		

Other potential short-term construction effects could include spillage of hazardous materials, and displacement of spawning fish by construction noise. Control of hazardous materials is a

standard provision in construction contracts and permits. Construction noise should not occur for more than a few days in any given stream crossing vicinity. If instream work is anticipated, the timing of the "work window" (e.g., during ditch and culvert sediment removal) specified in the Hydraulic Project Approval (HPA) would normally eliminate the potential impact of noise since spawning fish would not be present.

Long-term (operational) impacts of the Interim Use Trail are similar for most fish species, regardless of federal or state status. Impacts may be slightly greater on spawning adults of the various fish species than on juveniles rearing in the larger fish-bearing streams, although impacts are not expected to be significant. This would be particularly true for large, prominent coho spawners that may be holding near the trail crossing of Ebright, Pine Lake, Laughing Jacobs, and North Fork Issaquah Creeks.

Operational impacts on fish resources could result from increased human use of, and access to, fish-bearing streams. These impacts could include: disturbance to spawning fish by humans and domestic pets at stream crossings; fish poaching, trash and debris thrown from the trail into streams; and untreated human and animal waste entering streams. However, trail design elements (signs, fencing) and human behavior controls (regulations) can be placed and enforced to minimize and mitigate the effect of these impacts, therefore impacts are not expected to be significant.

Other operational impacts to fish resources could result from long-term ditch, bridge, and culvert maintenance, which typically involves the removal of sediment or vegetation blockage from ditches, or at culvert and bridge crossings. While the net effect of culvert and bridge maintenance typically improves stream flows and fish passage, there is a potential for periodic adverse impacts created by the disturbance and downstream release of sediments and debris. These impacts are, to a large degree, historically linked to the current water conveyance facilities of the railbed, many of which are old and outdated in design. Substantial sediment and/or vegetation accumulation generally develops on the smaller watercourses, not fish-bearing streams, reducing the potential for impacts. With incorporation of mitigation measures, these impacts are not expected to be significant.

MITIGATION

Preferred Alternative

Wildlife

Under the Preferred Alternative, trail construction and interim use would have only a minor effect on wildlife. Measures to minimize any potential impacts to wildlife include the following:

- Avoid use of noise-producing equipment in Segment 2 (where existing human disturbance is less intense than other parts of the project area, and where bald eagle breeding territory is located) during the early part of the nesting season (February to May). Noise disturbance can cause some birds to abandon their nests. In general, birds are most sensitive to disturbance during the early part of the nesting season. To minimize disturbance to wildlife and wildlife habitats from use of the trail, install interpretive signs and trail boundary signs.

- To ensure protection of the bald eagle nest in Marymoor Park, plant cedar trees or other native evergreen vegetation to create a year-round screen between the nest site and the trail.

Fish

For the Preferred Alternative, construction BMPs for erosion and sedimentation control would be implemented to protect fish habitat. Silt fences or other erosion control would be installed at all stream crossings to mitigate potential erosion impacts during removal of remaining railroad ties, fence construction, and sign installation. Careful placement of gravel near stream crossings using hand tools or light equipment would prevent crushed rock from entering stream channels. Trail shoulders should be stabilized in areas adjacent to streams to prevent erosion and sloughing. All in-stream culvert maintenance would occur between June 15 and September 15 to avoid potential impacts during critical salmonid spawning and incubation periods. Construction activities near stream crossings would be completed outside of the fish spawning period as stipulated in several of the required permits, which would reduce the potential disturbance from increased construction noise.

After construction, routine culvert and ditch maintenance should be done during the dry season. The trail would be fenced or screened at stream crossings to protect fish from human disturbance and maintain riparian vegetation. Access of trail users to stream banks and channels should be prohibited to prevent disturbance and erosion. Leashes would be required to prevent dogs from entering streams and harassing fish. Appropriate signs would be placed at stream crossings to explain the reasons for restrictions. Native riparian vegetation would be restored at stream crossings to improve habitat and provide shading.

Unstable stream banks at the George Davis Creek and Stream 0163 crossings should be stabilized and revegetated to prevent further erosion.

3.5 LAND AND SHORELINE USE

AFFECTED ENVIRONMENT

The proposed Interim Use Trail alignment passes through the Cities of Redmond, Sammamish, Issaquah, and unincorporated King County. Single-family residential use is the predominant land use along the corridor. Most of the area served by and adjacent to the proposed trail is designated by applicable land use plans as urban density residential with a density of 4 dwelling units per acre (King County, 1999c). Private beaches and undeveloped properties are situated among the single-family residences. Commercial and industrial businesses are located adjacent to the corridor in the City of Redmond, unincorporated King County, and the City of Issaquah.

IMPACTS

Preferred Alternative

Over the short-term, placement of gravel on the trail would impact an estimated 350 residences for a one-to-two-day period under the Preferred Alternative. Over the long-term, use of the trail may result in a perception of reduced privacy and visual impacts, potential property value impacts to selected properties, and safety-related impacts to adjacent properties. The greatest potential impact would be to the properties or current land uses that are bisected by the corridor. While impacts to the adjacent land uses would be unavoidable, property owners along similar trails in other areas noted that actual impacts were not as great as they had anticipated (City of Seattle, 1987; The Conservation Fund and Colorado State Parks, 1995; Feeney, 1997). With the incorporation of mitigation measures, impacts are not expected to be significant. The Preferred Alternative is consistent with adopted land use and recreation plans and policies, and the state's Growth Management Act and is an allowed land use under current zoning in all jurisdictions.

MITIGATION

Preferred Alternative

Measures to reduce impacts would include fencing and signage to delineate public versus private property.

3.6 SOCIO-ECONOMIC

This section discusses potential social and economic impacts that could occur following implementation of the Interim Use Trail.

AFFECTED ENVIRONMENT

Environmental Justice

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, requires each federal agency, to the greatest extent practicable and permitted by law, to achieve environmental justice as part of its mission. Agencies must address disproportionately high and adverse human health or environmental effects on minority and low-income populations. The proposed trail is located in an area that does not include disproportionately high populations of minority or low income individuals (U.S. Census Bureau, 2001).

Railbanking and Property Ownership

Some area residents have questioned the nature of King County's ownership of the railroad corridor and the legality of the railbanking process. Several comments indicate that many adjacent property owners assumed the railroad property would revert to them when the railroad ceased operating.

King County purchased all of the property rights which formerly belonged to Burlington-Northern Railroad, for 11.61 continuous miles along the East Lake Sammamish rail corridor. The 73 title reports prepared for King County prior to the acquisition verified that Burlington Northern owned a continuous, unbroken rail corridor along East Lake Sammamish. The railroad and its predecessors originally acquired the corridor via federal land grants, deeds, rights-of-way deeds, quitclaim deeds, warranty deeds and adverse possession. This patchwork of ownership sources resulted in a mix of fee and easement-type ownership interest. King County determined that 80% percent of the line in linear terms was held by the railroad in fee. The remainder is held as something less than fee absolute.

In 1983, Congress amended the 1968 National Trails System Act to permit railbanking as an alternative to outright abandonment of railroad rights-of-way and to give interested trail sponsors the opportunity to negotiate agreements with rail carriers to use these rights-of-way for trails (16 USCA § 1247). Specifically, the amendments to the Act state that "the Secretary of Transportation, Chairman of the Surface Transportation Board, and Secretary of the Interior…shall encourage state and local agencies and private interests to establish appropriate trails using the provisions of such programs" (16 USCA § 1247). Pursuant to the Interstate Commerce Commission Termination Act (ICCTA), the federal Surface Transportation Board (hereinafter referred to as Board) administers the railbanking program under a set of federal regulations contained in the Code of Federal Regulations (49 CFR 1152). Any order from the Board, including railbanking orders, can only be challenged by bringing an appeal to the Federal Court of Appeals.

Railbanking allows a railroad to discontinue rail service without abandoning the line. There is a substantial difference between "abandonment" and "discontinuance" of service under the ICCTA. Once a carrier "abandons" a rail line pursuant to authority granted by the Board, the line is no longer part of the national transportation system. Although the Board is empowered to impose conditions on abandonments, the Board jurisdiction generally terminates once a rail line is abandoned, and authority reverts to state law. Preseault v. Interstate Commerce Commission, 494 U.S. 1, 6, 110 S. Ct. 914, 919, 108 L. Ed. 2d 1 (1990). In contrast, the Board may grant rail line "discontinuance", which allows a railroad to cease operation for an indefinite period while preserving the rail corridor for possible future reactivation. The ability to grant this status is the basis for the railbanking amendment to the National Trails System Act. Id. at 6.

Generally, if an abandonment of a line occurs, any easements limited to use for operation of a rail line would be extinguished. At that point, the owner of the property over which the easement runs would have their property freed from the encumbrance of the railroad easement. The Railbanking amendments to the National Trails System Act specifically prevent those easements from being extinguished if rail service is discontinued under railbanking. As a result, the railbanking amendments have been subject to a number of constitutional challenges throughout the country.

In Preseault, the U.S. Supreme Court upheld the constitutionality of railbanking. However, the Court also acknowledged that property owners in some cases may request compensation for property takings caused by the application of 16 U.S.C. 1247(d) when a rail to trail conversion occurs. The Supreme Court further found that Congress had provided for any claims that might arise from railbanking. They indicated that any claims would be handled through the United States Court of Claims.

In September of 1998, the Board approved railbanking of the East Lake Sammamish Rail Corridor. King County then entered into an agreement to purchase the corridor and use it to operate a recreation trail, i.e., become a trail sponsor. There are no appeals of the Board order pending in the Federal Court of Appeals and the time for such an appeal has long passed. Therefore, the Board's order effectively is beyond challenge and any easement transferred by the railroad to King County that is subject to extinguishment as the result of discontinuance of rail service is still in effect . However, if any landowner can prove they own property that would otherwise have been freed from an easement as a result of the discontinuance of rail service pursuant to the Board's order, that landowner may have a claim for damages against the United States in the Court of Claims.

Locally, several property owners have filed legal challenges to King County's ownership of the corridor and the county's authority to build the Interim Use Trail. There are two cases challenging the County's ownership of certain portions of the corridor that have been decided in the County's favor by the trial court. Each court found the County owns the corridor in these areas in fee simple. These cases are on appeal. There are eight (8) other cases that have been brought against the County challenging the County's ownership. These are pending in King County Superior Court and have been consolidated for pretrial proceedings. King County also has brought a case against two adjacent landowners seeking an order establishing the County's exclusive control of the corridor in the area at issue. This case is also pending in King County Superior Court. Therefore, there are eleven (11) cases in various stages of litigation where King County's ownership interest in portions of the corridor is at issue. However, the Surface Transportation Board determined that the railroad had a sufficient property interest in the corridor to allow for railbanking, i.e. construct a trail in place of the rail line. As explained above, the Surface Transportation Board has exclusive jurisdiction over the operation of a rail line until the line is abandoned. Therefore, since the line is railbanked, not abandoned, the County will retain the authority pursuant to the Board's order to develop a trail on the railbanked corridor regardless of the outcome of these property disputes.

Safety and Security

In addition to those issues discussed above, safety and security issues are a concern for area residents. Existing literature on trails and other sources were consulted to assess trends in safety and security concerns on previously established trails. Incident report data obtained from King County Police were evaluated to establish a baseline for crimes and incidents reported by residents along East Lake Sammamish Parkway. The occurrence of accidents along East Lake Sammamish Parkway were the most commonly reported incident; trespass was also reported in approximately half of the seven corridor segments. Refer to the SEPA DEIS and FEIS for a detailed discussion of safety and security issues related to the proposed East Lake Sammamish Interim Use Trail.

IMPACTS

Preferred Alternative

Environmental Justice

The East Lake Sammamish Interim Use Trail is not proposed to traverse an area with disproportionately high populations of minority or low income individuals. Therefore, no significant impacts are expected.

No significant impacts to local businesses are expected. The existence of the trail should draw more people into the area, increasing the demand for goods and services. Local industry may benefit from the alternative transportation option the trail offers to employees. No significant impacts to economic conditions are expected as a result of the East Lake Sammamish Interim Use Trail.

Railbanking and Property Ownership

As described above, no significant impacts to property ownership are expected as a result of the Preferred Alternative. King County was able to acquire Burlington-Northern's ownership interest in the corridor as a result of the Board's approval of railbanking. A search for available data regarding potential impacts to property values as a result of rail-trail implementation was conducted. Seven studies were identified that directly addressed the issue of property values. None of these sources indicated that the presence of a rail-trail would be expected to result in a decrease in property values (City of Seattle, 1987; Miller-Murphy, 1992; Moore et al., 1992; Maryland Greenways Commission, 1994; Conservation Fund and Colorado State Parks, 1995; Feeney, 1997; NARPO, 1997). The majority of studies indicated that the value of properties near or adjacent to the Preferred Alternative are expected to remain the same or increase as a result of the presence of a rail-trail. Economic impacts, including impacts to property values, are difficult to quantify and depend on many factors that are both local and region-wide and are not related to adjacency to a recreational trail. These factors include employment patterns, market demand, development patterns, preferences of individual potential buyers, and infrastructure improvements. However, as indicated by the studies reviewed, no significant adverse economic impacts are expected to result from the construction of the Preferred Alternative.

Safety and Security

A perceived increase in opportunity for trespass or private property vandalism exists among adjacent property owners. Occasional incidents of trespass or private property vandalism could occur following implementation of the Preferred Alternative but would not be expected to exceed existing conditions. Major crimes such as robbery are possible, although are expected to be similar to, or less than, that experienced in other venues where people gather for recreation purposes. As a result, with incorporation of adequate public safety mitigation measures, public safety impacts are not expected to be significant.

Because the proposed East Lake Sammamish Interim Use Trail is a new trail, the evaluation of public safety issues relies on existing information from other trails. Most information about crime and safety on rail-trails in the United States is anecdotal in nature and not supported by robust statistical evidence. However, these studies suggest that trails within urban and suburban areas do not experience disproportionately high rates of crime relative to other types of recreational venues or meeting places. Crime rates are generally considered low on rail-trails and the development of rail-trails does not generate an increase in crime (City of Seattle, 1987; The Conservation Fund and Colorado State Parks, 1995; Feeney, 1997; Tracy and Morris, 1998). Similar conditions have been found along the Burke-Gilman Trail in Seattle, a trail with similar characteristics to the proposed project. For instance, the Burke-Gilman Trail in Seattle comes quite close to homes in many locations and in some places separates parking areas from homes. Additionally, the Burke-Gilman trail is adjacent to Lake Washington waterfront properties.

Accidents that occur on multiple use trails result from various factors. These include reckless and irresponsible behavior, poor user preparation or judgment, and unsafe trail conditions (Moore et. al., 1992; Moore, 1994). One of the main complaints of residents living next to the Burke-Gilman Trail along the east shore of Lake Washington is the speed of bicyclists on the mixed-use trail (City of Seattle, 1987). Anecdotal reports of high-speed bicycling on the Burke-Gilman are common (for example, see Conklin, 1998; Biking with Kids, online 1999). Because the Burke-Gilman Trail is open to all forms of non-motorized transportation except equestrian, the range of user speeds is quite large and has sometimes led to accidents between users. Similar concerns and complaints have been recorded for other rail-trails in the United States (Craig and Wake, 1999; Moore et al., 1992).

Impacts to public safety resulting from the trail are expected to be non-significant over the long term, comparable to recreational trails already in place throughout the County. The surface of the proposed East Lake Sammamish Interim Use Trail would be gravel, and it is anticipated that this difference would significantly reduce the speed of users and minimize accident potential.

One of the issues raised by adjacent property owners is their concern about liability if use of their waterfront facilities by trespassers creates injury. The use of signage identifying trail boundaries, and fencing, would discourage trespassers on private property. The Interim Trail Plan recommends fencing the lake side of the trail in locations where there are no residences between the trail and the lake or where conditions such as recreational equipment or improvements might constitute an attractive nuisance. The recreational immunity statute, RCW 4.24.210, may limit the liability of property owners who own land adjacent to recreational land if certain conditions are met. Citizens should seek a legal opinion on the possible protections offered by this statute.

MITIGATION

King County could implement the following mitigation measures related to public safety, which have proven effective in providing reasonable public safety in other King County Parks:

- Limit trail use to daylight hours. King County regulates trails as linear parks; trails are subject to usage restrictions per King County Code section 7.12.480.

- Implement trail patrols by volunteer trail ranger programs (Doherty 1998; Tracy and Morris, 1998).
- Monitor crime rates in the area; provide additional coordination with law enforcement if crime rates increase.
- Maintain the trail in a safe and clean manner.
- Provide master keys to locked bollards to all emergency service agencies serving the corridor (Eksten, personal communication, 2000).
- Fencing (see Visual section for details).
- Signage and enforcement of trail rules and etiquette.
- Signage along corridor to educate trail users about the limits of the public right-of-way and to warn against trespass of private property (Moore, 1994).
- Limit speed for bicyclists per King County's Trail Use Ordinance number 8518, that establishes a speed limit of 15 miles per hour for all trails.
- Notify adjacent property owners of proposed construction schedule.
- Notify emergency service providers of proposed construction schedule.

3.7 TRANSPORTATION

AFFECTED ENVIRONMENT

Existing roadway, traffic, and access characteristics; parking issues; as well as accident history along the project corridor were described for this EA. Potential impacts resulting from the East Lake Sammamish Interim Use Trail Preferred Alternative on existing roadways were evaluated. Please refer to Appendix E for a detailed description of existing conditions and potential impacts.

The proposed East Lake Sammamish Interim Use Trail is located west of, and parallel to, East Lake Sammamish Parkway NE/SE. Public streets crossing the proposed Interim Use Trail include NE 65th Street in the City of Redmond; SE 33rd Street and 206th Ave SE in the City of Sammamish; and the Lake Sammamish State Park Entrance, SE 51st Street, SE 56th Street, SE 62nd Street, and Gilman Boulevard in the City of Issaquah and unincorporated King County. Public access to the railbed is provided at these public street crossings. State Route (SR) 520, Interstate-90 (I-90), Inglewood Hill Road, Louis Thompson Road, East Lake Sammamish Place, and SE 43rd Way are other key roadways in the study area. Most arterial roadways in the study area are operating at or near capacity. During peak hours, many intersections near the north and south segments of the proposed trail are operating at or near capacity.

Parking in the study area is available at Marymoor Park, Lake Sammamish State Park, and along NE 65th Street. Peak parking demand generally occurs on weekends in the spring/summer, when additional parking is available at King County District Court.

IMPACTS

Preferred Alternative

Under the Preferred Alternative, an estimated 7,100 cubic yards of gravel would be placed on the railbed. This would result in approximately 1,428 one-way truck trips over the approximately 8 to 12 weeks of construction. While truck traffic may result in temporary traffic delays, impacts would be short-term in nature and would not be significant.

Once completed, the Preferred Alternative would generate approximately 200 one-way vehicle trips on a peak weekend day. A daily parking demand of up to 125 vehicles could be expected on a peak summer weekend. It is anticipated that parking would be available at area parks. An increase in illegal parking may be noticed along the corridor and at Lake Sammamish State Park. Increased patrols and signage would minimize this impact over the long-term. No significant impacts would occur.

There is a potential for conflicts between trail users and vehicles at intersections with roadways and driveways, but impacts would be mitigated to a level of non-significance through signage and access controls. See the Trail Intersections Appendix (King County, FEIS 2000).

MITIGATION

Preferred Alternative

Regulatory signs for trail users and vehicles would be posted at intersections. Removable bollards would be installed at trail/roadway crossings to allow emergency/maintenance vehicle access and restrict motor vehicle access to the trail. Signs would be posted to prevent illegal parking in unauthorized areas.

3.8 CULTURAL AND HISTORICAL RESOURCES

AFFECTED ENVIRONMENT

The proposed East Lake Sammamish Interim Use Trail corridor was evaluated for the presence of cultural and historical resources. A literature search was conducted as well as an on-site visit to look for visible evidence of cultural and historical resources.

The proposed Interim Use Trail is within the territory of the Sammamish, a Duwamish subgroup, and the Snoqualmie people. Prehistoric cultural resource sites are located in the vicinity of the proposed trail at both the northern and southern ends of the route; six sites are located within one mile of Segment 1 of the proposed trail. One is listed on the National Register of Historic Places (NRHP). One site has been identified within one mile of Segment 6, and one site within one mile of Segment 7. Sites contain lithic scatters and artifacts such as blades and basalt cobble tools. None of these prehistoric resources is located on or immediately adjacent to the trail.

Four historic sites are located within one mile of, and adjacent to, the proposed trail. Four sites have been identified within one mile of Segment 1; these sites include two mansions, a Dutch windmill, and a historic road. Three of these four are listed on the NRHP. One site is located within one mile of Segment 6 and contains several historic artifacts. Four historic sites, including a barn, an abandoned railway grade, a concrete reservoir and concrete foundation, are located within one mile of Segment 7. The barn, called Pickering Barn, is listed on the NRHP. None of these historic resources is located on or immediately adjacent to the trail.

See Appendix F for a detailed description of Affected Environment.

IMPACTS

Preferred Alternative

Subsurface disturbance associated with construction of the Preferred Alternative would be limited; therefore, potential impacts to cultural and historical resources are expected to be minimal. Re-surfacing the trail with gravel would require no excavation and would therefore not disturb any subsurface cultural resources. Maintenance of culverts has a slight potential to disturb cultural resources if excavation occurs. Installation of signs and fencing have a limited potential to disturb cultural resources associated with excavation for post placement. No significant impacts to cultural or historic resources would occur.

MITIGATION

Preferred Alternative

An archaeologist should be present during all construction excavation activities.

3.9 VISUAL

AFFECTED ENVIRONMENT

The existing aesthetics and visual quality of the proposed Interim Use Trail corridor were evaluated in terms of compatibility and compositional harmony with the existing environment. The Interim Use Trail would traverse the entire length of the eastern shore of Lake Sammamish. Views of and toward Lake Sammamish are a predominant visual feature. However, the location of the corridor relative to the lake's shoreline varies considerably. Some areas have a considerable amount of separation between the corridor and homes and buildings, while other segments have little or no separation, bringing the corridor, and in some places the railbed itself, into close proximity to homes or other buildings.

IMPACTS

Preferred Alternative

Impacts related to the general aesthetics and visual quality of the railbed and corridor are anticipated to be non-significant under the Preferred Alternative. The corridor has been cleared with little or no vegetation since the opening of the Burlington Northern Railroad; therefore, the general look would remain unchanged. In addition, a number of mitigation measures would be implemented to reduce visual impacts on adjacent homes. This would result in potential visual impacts to some existing residents, but would provide an optimum balance of views for trail users and homeowner privacy.

Where possible, existing vegetation and topography would be used in locating the fences to assist in minimizing impacts to views. However, some residents have stated that they perceive the presence of chain-link fencing as a negative impact. With the incorporation of mitigation measures, no significant impacts are anticipated.

MITIGATION

Under general circumstances, the following mitigation would apply:

- Split-rail fencing would be installed in areas where wetlands and streams need to be protected;
- Black vinyl-coated chain-link fencing is proposed in areas where less than 20 feet exist between the trail and a home (unless an access road already exists between the trail and the home), and in areas where docks and waterfront property create a safety and/or security concern;
- Slats may be used for privacy at some locations.

In addition, top rails and bottom tension wire would be used to keep the chain-link fabric taught and the fence line true, maximizing views.

3.10 NOISE

AFFECTED ENVIRONMENT

Existing noise sources along the corridor include vehicles on East Lake Sammamish Parkway, airplanes, boats/watercraft, and miscellaneous neighborhood sounds. East Lake Sammamish Parkway traffic is the dominant noise source along the corridor (Michael R. Yantis Associates, 1995; King County, 1998c).

IMPACTS

Preferred Alternative

Temporary noise level increases would be experienced during construction of the Preferred Alternative. Construction would only occur during weekday hours. Long-term sources of noise resulting from the trail include spoken conversations, footfalls on the gravel surface, and noise from bike traffic. Motorized vehicles would be prohibited from using the trail with the exception of emergency and maintenance vehicles. This impact is anticipated to be minor because of the dominating noise source on East Lake Sammamish Parkway and the generally low level of noise from actual trail use.

Noise impacts to wildlife and fish along the proposed trail corridor are discussed in section 3.4 Wildlife and Fish.

MITIGATION

No measures to mitigate noise impacts are proposed as no impacts are expected. Measures to mitigate noise impacts to fish and wildlife are discussed in section 3.4 Wildlife and Fish.

3.11 UTILITIES AND PUBLIC SERVICES

AFFECTED ENVIRONMENT

Utilities

Typical of its urbanized character, numerous local and regional utilities are located in the vicinity of the corridor. Utilities include telephone, water, sewer, storm drainage, electricity, and natural gas.

Public Services

Public service providers in the vicinity of the proposed Interim Use Trail include providers from four jurisdictions: City of Redmond, City of Sammamish, City of Issaquah, and King County. Police services are provided by Redmond, Sammamish/King County, and Issaquah. Fire department and medical emergency services are provided by the City of Redmond and Eastside Fire and Rescue (City of Sammamish north border to Issaquah).

IMPACTS

Preferred Alternative

Impacts to utilities are anticipated to be minor. Short-term disruption to utilities such as water, sewer or electric service located along East Lake Sammamish Parkway are possible as a result of construction of the Preferred Alternative.

Impacts related to public services (i.e., police, fire, medical emergency) are anticipated to be minor. When questioned about anticipated needs following trail implementation, nearly all local public service jurisdictions do not anticipate the need to increase staff or services as a result of the Preferred Alternative. The need for additional patrol and maintenance (e.g., parking enforcement, restroom maintenance, litter control) may be required at Marymoor Park. To minimize impacts, trail use would be limited to daylight hours. Additionally, the city of Sammamish has requested funding for bicycle patrols on the trail, should it be opened. Emergency service agencies would be given keys to unlock the bollards at all corridor entrances.

MITIGATION

No measures to mitigate impacts utilities or public services are proposed as no impacts are expected.

3.12 RECREATION

AFFECTED ENVIRONMENT

King County currently owns and manages a number of recreational trail resources. At present, there are over 100 miles of paved and nearly 70 miles of unpaved regional trails in King County. Additional miles of trail are proposed that will connect existing trails in the region, creating a continuous network of non-motorized transportation corridors. The proposed East Lake Sammamish Interim Use Trail would connect to the Sammamish River Trail at the north end via Marymoor Park, which is connected to the Burke-Gilman Trail that continues around Lake Washington to Ballard in Seattle. Comments received during the SEPA scoping process regarding recreation indicated a desire for the trail to be multi-use and that additional recreational and transportation resources are needed in the County. The Interim Use Trail would be open to all non-motorized uses except horses, and would provide a link to other regional trails.

The cities of Redmond, Sammamish, and Issaquah own and maintain a variety of recreation opportunities. Redmond operates several miles of trails and a system of parks that contain trails and other amenities. King County's Marymoor Park is included within Redmond's boundaries; Redmond is also in the process of establishing the East Lake Sammamish Waterfront Park. Sammamish owns and operates public parks, some of which are still in the development stage. Some of these new parks may contain trails. Issaquah maintains a system of recreational and regional trails. Lake Sammamish State Park is located at the southerly end of the corridor and can be accessed via the Pickering Trail and bike lanes from the City of Issaquah.

The development of trails is supported by the City of Redmond *Parks, Recreation, and Opens Spaces Plan* (1997), *Comprehensive Plan* (1997), and the *Recreational Trails Plan*. The City of Issaquah's *Final Comprehensive Plan* (1995/1997) and *Issaquah Area Wildlife and Recreation Trails Plan* (1992) also support the development of recreational trails. The City of Sammamish is in the process of developing a parks, recreation, and trails plan (Mathes, personal communication, 2000). Trail development has been supported by King County since 1971. The current East Lake Sammamish Trail is specifically identified as a potential East Lake Sammamish Trail in the following King County documents: *King County Urban Trails Plan*

(1971), *King County General Bicycle Plan* (1975), *King County Regional Trails Plan* (1992), and the *King County Nonmotorized Transportation Plan* (1993). More recently, the *King County Park, Recreation, and Open Space Plan* (1996) identified regional and local trail systems as important to providing recreation and circulation within local communities and to linking urban and rural areas of the county. Section S-104 of the *King county Park, Recreation, and Open Space Plan* states "King County should complete a regional trail system, which includes connections between trail corridors to form a countywide network."

IMPACTS

Preferred Alternative

During construction of the trail, residents along the corridor may experience temporary disruptions to recreational activities in their yards and on their boat docks. These impacts would typically last a week or less for any individual property owner.

Development of the proposed Interim Use Trail is consistent with adopted recreation plans and policies. The Interim Use Trail is anticipated to attract up to 500 users per day during peak periods. Long-term impacts include the potential for non-motorized accidents with trail users, and incidents with dogs on the trail. Trail users may disrupt passive recreation activities at adjacent residences. There is potential for some trail users to trespass onto private lands of adjacent property owners. The gravel surface proposed for the trail may benefit some users and hinder others. Restroom facilities are not proposed along the trail, which may result in increased use of other available public restroom facilities or illicit use of private property. The County would explore options for placement of portable restrooms at appropriate locations.

As the region's population continues to grow, demand for trails is expected to expand. The No Action Alternative would result in this increased demand being met by existing trail facilities in the region. The increased use of roadways for non-motorized transportation would result in an increased potential for accidents with motorized vehicles. The No Action alternative is not consistent with adopted plans and policies, including the *King County Park, Recreation and Open Space Plan, King County Urban Trails Plan, King County General Bicycle Plan, King County Regional Trails Plan, King County Non-motorized Transportation Plan, City of Redmond Parks, Recreation and Open Space Plan,* and the *City of Issaquah Final Comprehensive Plan*.

MITIGATION

No measures to mitigate impacts to recreation are proposed as no impacts are expected.

3.13 CUMULATIVE IMPACTS

In addition to long-term ditch, bridge, and culvert maintenance, on-going culvert inspection and replacement would occur as part of the *Storm Drainage Maintenance Plan* (King County, 2001b). This maintenance plan could result in cumulative increases in sedimentation, associated with culvert maintenance and replacement. Culvert inspection and replacement would include

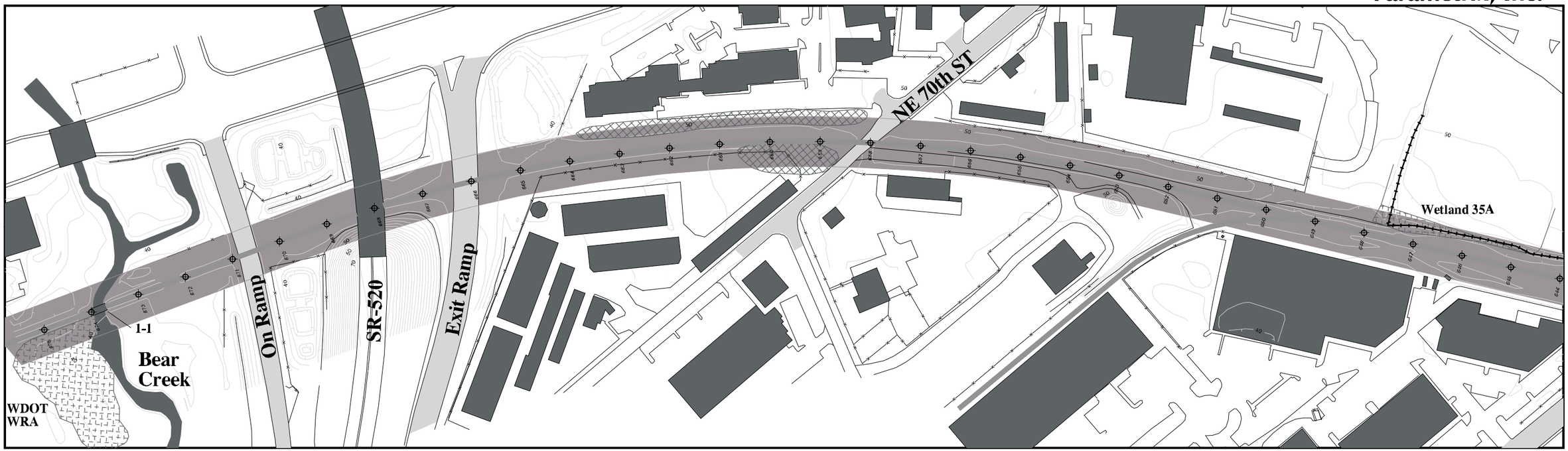
maintaining documentation of drainage problems and culvert inspections; annual review and prioritization of culvert repair and/or replacement needs; design for replacement of 1-3 culverts per year, if needed, with associated fish passage improvements as needed. The Storm Drainage Maintenance Plan was developed as an interim measure to ensure a functioning storm drainage system until a comprehensive storm drainage improvement plan is developed as part of the master plan.

Concurrent implementation of fish passage improvements would be accomplished consistent with an approved trail drainage maintenance plan (see section 3.4, Fish and Wildlife).

Culvert replacement would have impacts similar to that described for culvert maintenance and could include short-term releases of sediment downstream. With incorporation of mitigation measures, these impacts are not expected to be significant. The culvert inspection and replacement portion of the *Storm Drainage Maintenance Plan* would have long-term beneficial impacts upon fish passage along the proposed Interim Use Trail.

Consideration was given to impacts that might be generated by long-term use and operation of the Interim Use Trail. Discussion was included in individual subject area sections of this chapter.

A



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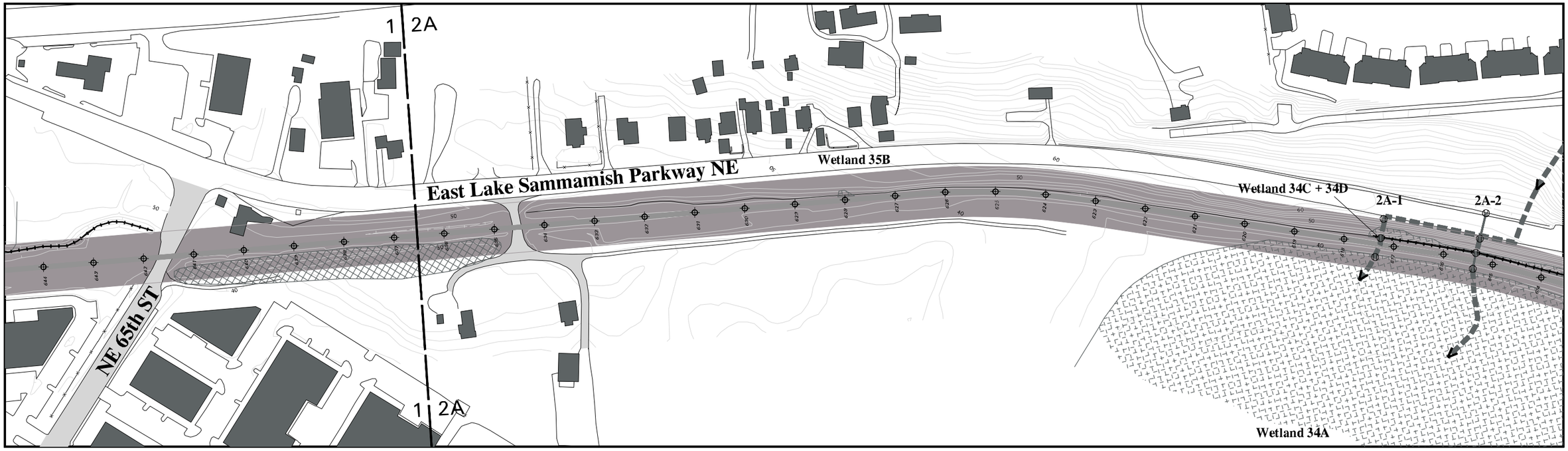

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Scale in Feet

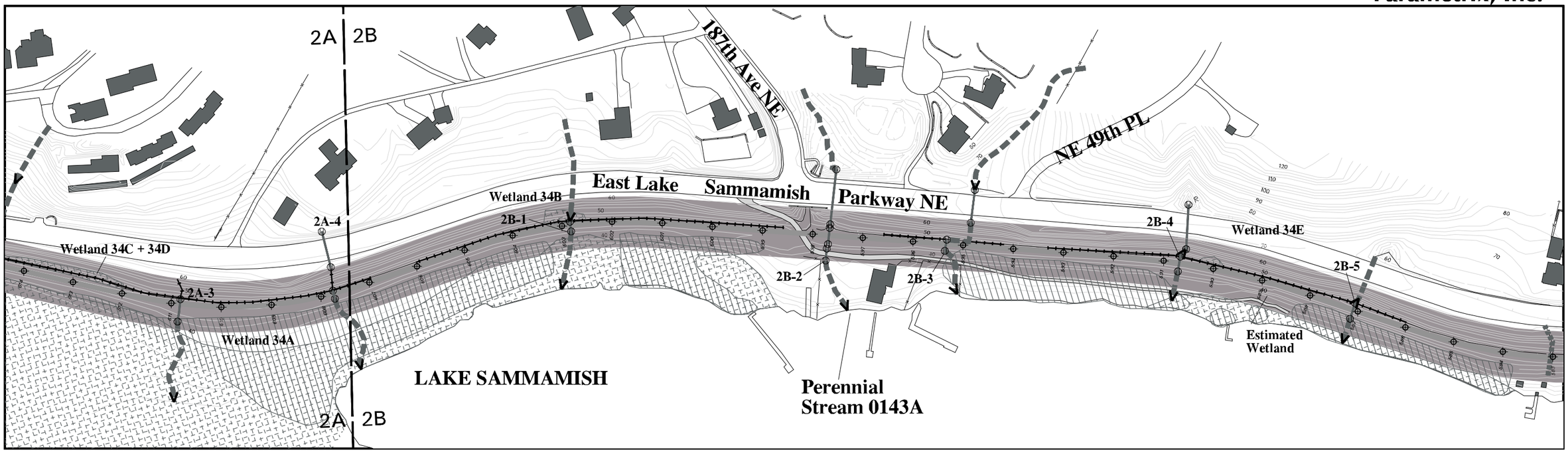
- Right of Way
- Roads
- Driveways
- Coniferous Trees
- Wetland
- Urban Matrix *
- Rail Bed
- Stream
- Ditch
- Survey Station
- Culvert Inlet or Outlet

* Areas within 30 feet of either side of the trail that are not mapped as Deciduous Trees, Coniferous Trees, or Grassy Field are classified as Urban Matrix. Urban Matrix is a mix of buildings, asphalt, ornamental gardens, and shrubby/grassy areas with scattered trees.

Figure 3-A
East Lake Sammamish Trail
Draft Site Assessment Maps

Parametrix, Inc.

A



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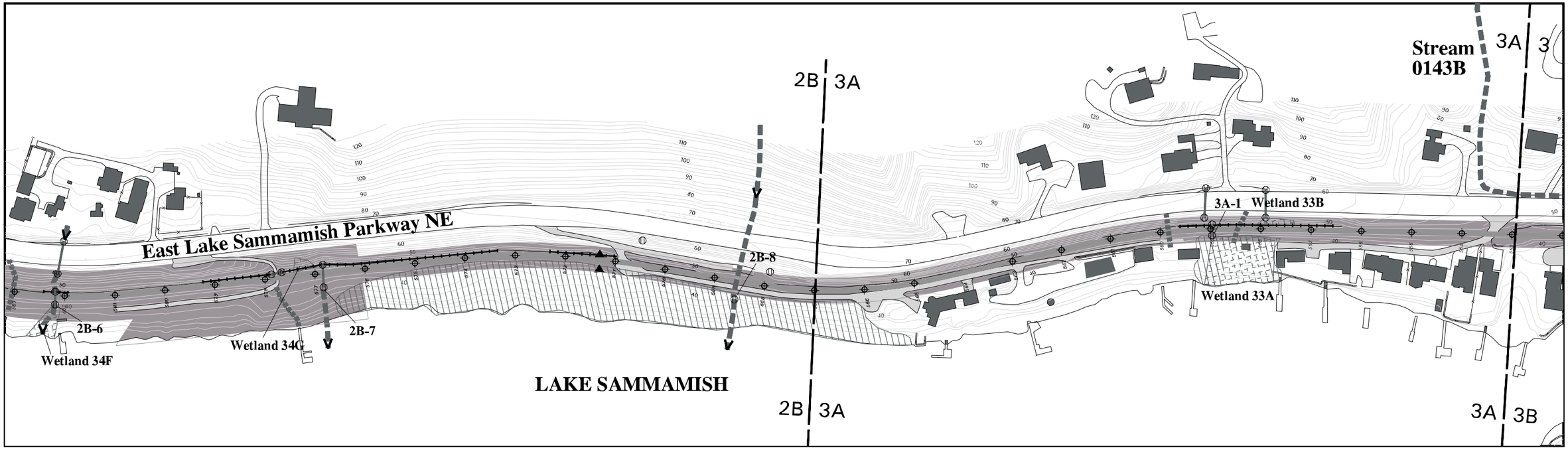

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Scale in Feet

Right of Way
Driveways
Deciduous Trees
Wetland
Urban Matrix *

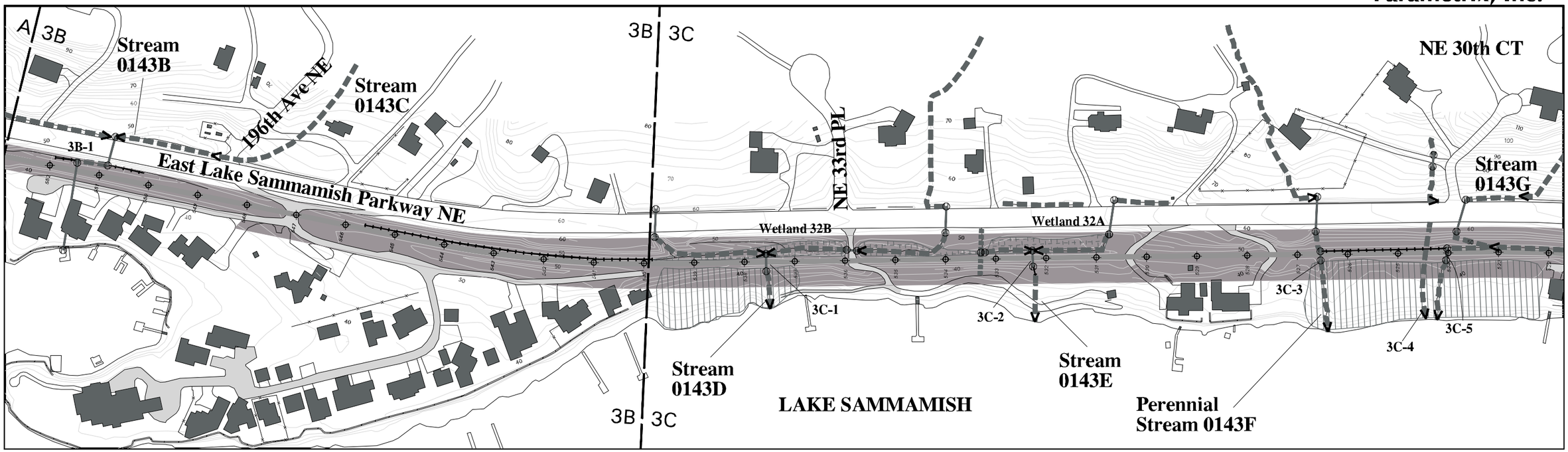
Rail Bed
Residential Path
Stream
Ditch

Survey Station
Unverified Culvert
Culvert Inlet or Outlet

* Areas within 30 feet of either side of the trail that are not mapped as Deciduous Trees, Coniferous Trees, or Grassy Field are classified as Urban Matrix. Urban Matrix is a mix of buildings, asphalt, ornamental gardens, and shrubby/grassy areas with scattered trees.

Figure 3-B
East Lake Sammamish Trail
Draft Site Assessment Maps

A



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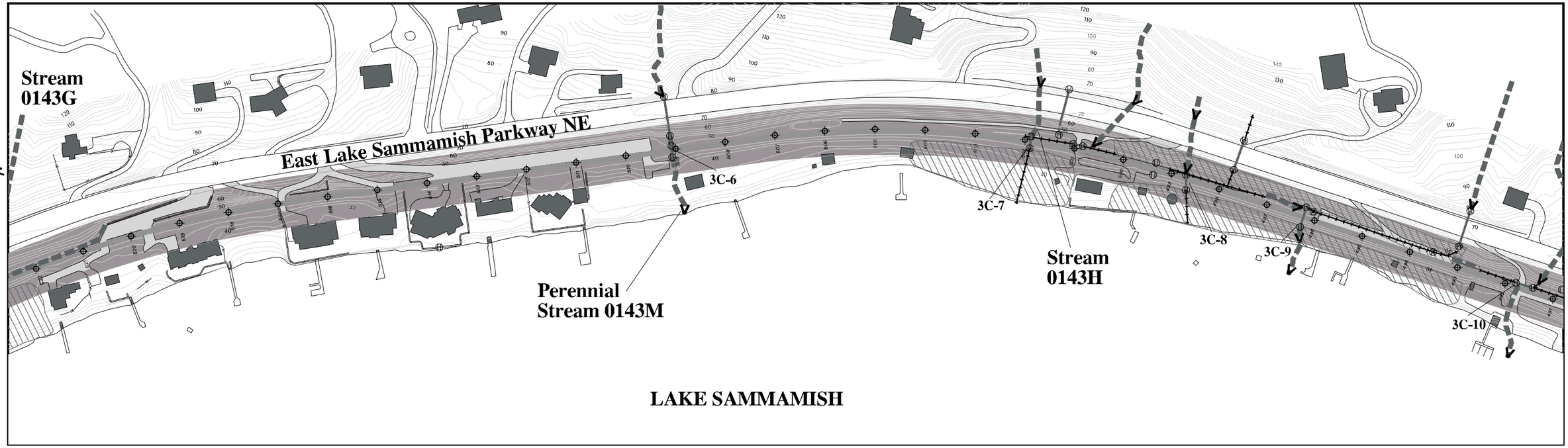

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0 200 400

Scale in Feet

- Right of Way
- Driveways
- Deciduous Trees
- Wetland
- Urban Matrix *
- Rail Bed
- Residential Path
- Stream
- Ditch
- Survey Station
- Culvert Inlet or Outlet

* Areas within 30 feet of either side of the trail that are not mapped as Deciduous Trees, Coniferous Trees, or Grassy Field are classified as Urban Matrix. Urban Matrix is a mix of buildings, asphalt, ornamental gardens, and shrubby/grassy areas with scattered trees.

Figure 3-C
East Lake Sammamish Trail
Draft Site Assessment Maps

Parametrix, Inc.

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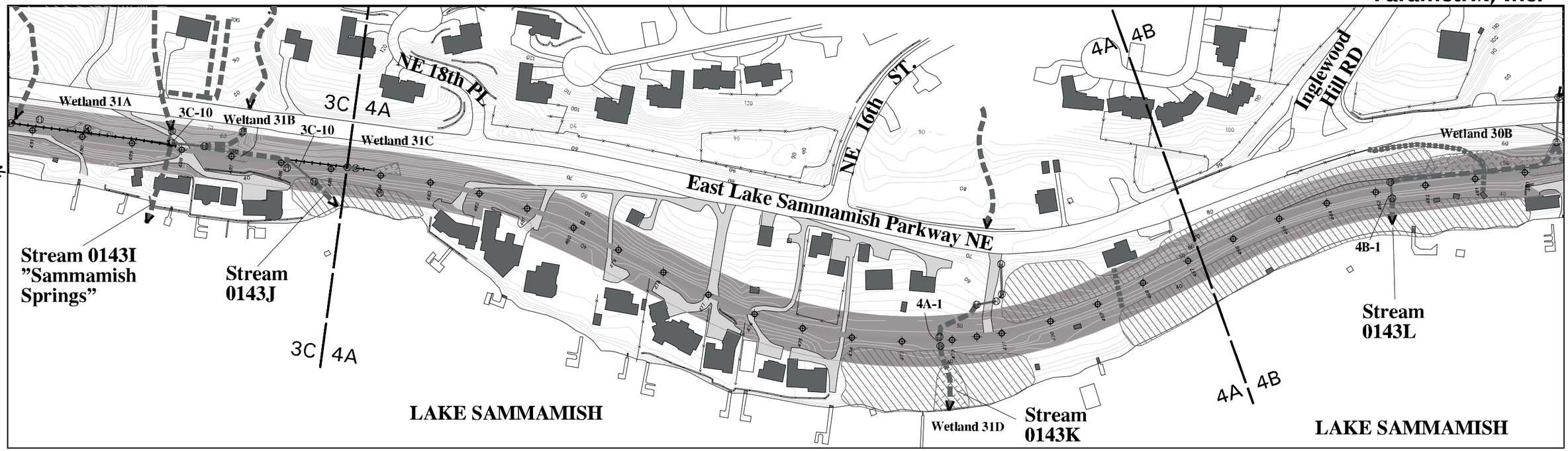

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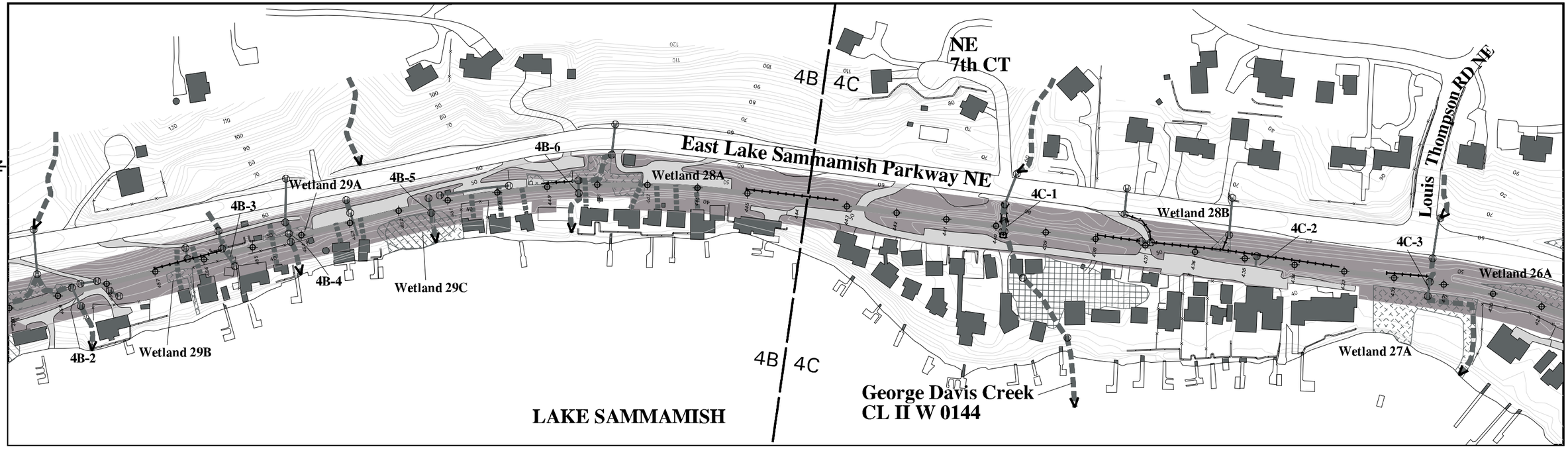

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Scale in Feet

- Right of Way
- Driveways
- Deciduous Trees
- Coniferous Trees
- Wetland
- Urban Matrix *
- Rail Bed
- Residential Path
- Stream
- Ditch
- Survey Station
- Culvert Inlet or Outlet

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Figure 3-D
East Lake Sammamish Trail
Draft Site Assessment Maps

A

Estimated Wetland
Ebright Creek CL II W 0149
Estimated Wetlands
Wetland 64
Estimated Wetlands
4C-4
East Lake Sammamish Parkway NE
Wetland 25F
Wetland 25C
East Lake Sammamish Parkway SE
Wetland 25A
Wetland 26A
4C-5
Wetland 25D
Wetland 25B
4-C6
Wetland 26C
Wetland 26B
Wetland 27A
Stream 0150A
Zaccuse Creek CL II W 0145A
LAKE SAMMAMISH

B

Estimated Wetlands
SE 8th ST
Wetland 65
Pine Lake Creek 0152
4C
4D
Estimated Wetland
Wetland 25A
East Lake Sammamish Parkway SE
Wetland 22D
4C-10
Wetland 23A
4C-9
Wetland 23C
Wetland 24A
Wetland 24C
4C-7
4C-8
Wetland 23B
Wetland 24B
Wetland 24D
4C
4D
LAKE SAMMAMISH

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0 200 400

Scale in Feet

- Right of Way
- Driveways
- Deciduous Trees
- Coniferous Trees
- Wetland
- Urban Matrix *
- Rail
- Residential Path
- Stream
- Ditch
- Survey Station
- Culvert Inlet or Outlet

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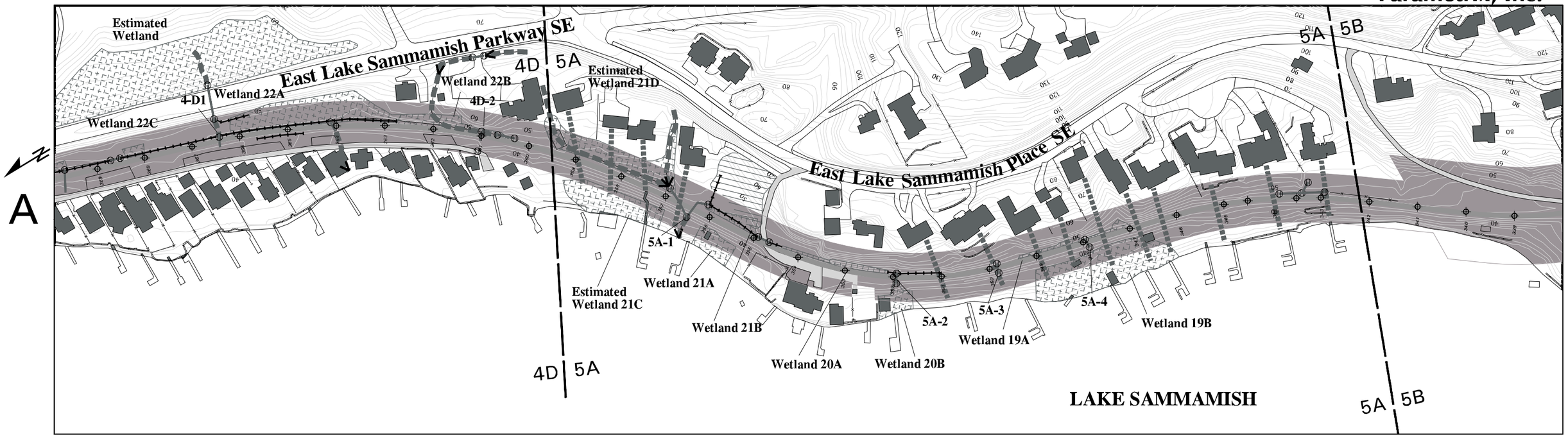
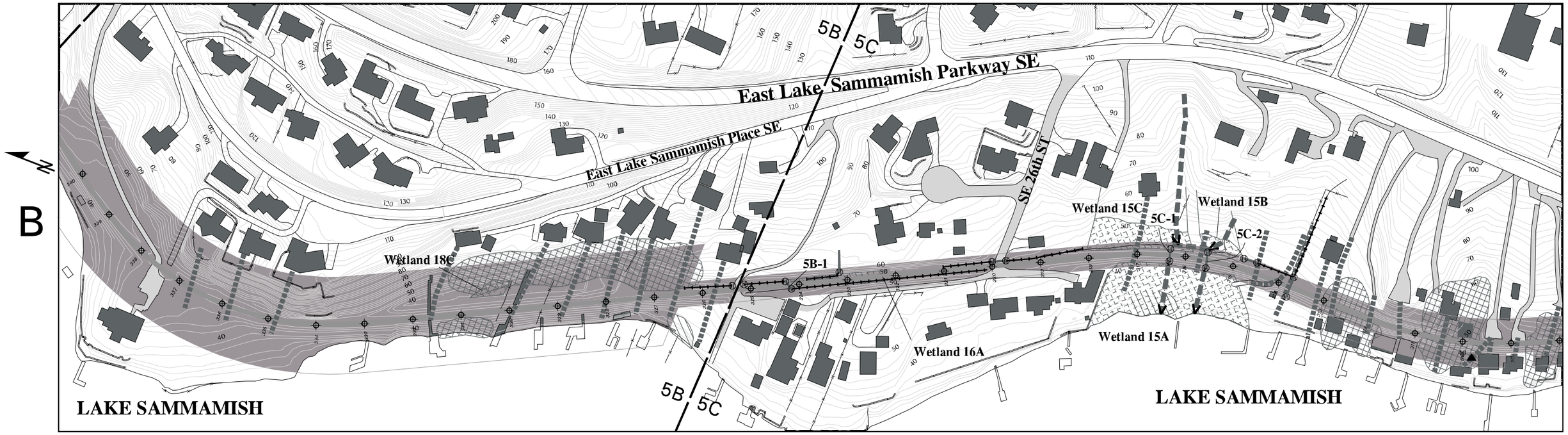
Figure 3-E
East Lake Sammamish Trail
Draft Site Assessment Maps

Parametrix, Inc.





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0 200 400

Scale in Feet

- Right of Way
- Driveways
- Deciduous Trees
- Coniferous Trees
- Wetland
- Urban Matrix *
- Rail
- Residential Path
- Stream
- Ditch
- Survey Station
- Culvert Inlet or Outlet

* Areas within 30 feet of either side of the trail that are not mapped as Deciduous Trees, Coniferous Trees, or Grassy Field are classified as Urban Matrix. Urban Matrix is a mix of buildings, asphalt, ornamental gardens, and shrubby/grassy areas with scattered trees.

Figure 3-F
East Lake Sammamish Trail
Draft Site Assessment Maps

Parametrix, Inc.

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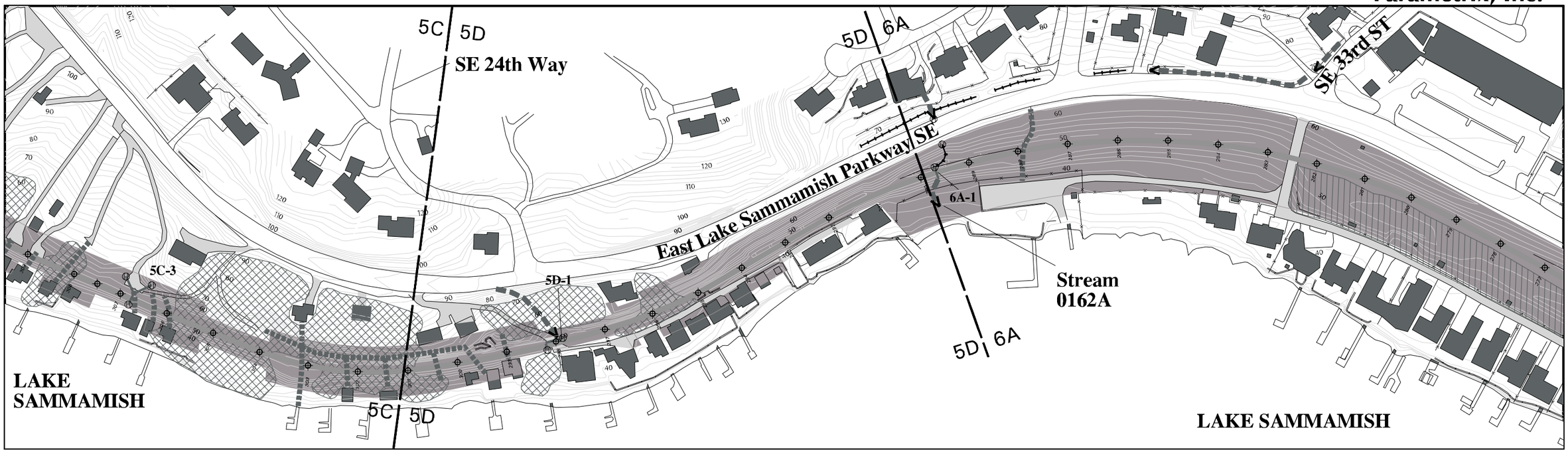

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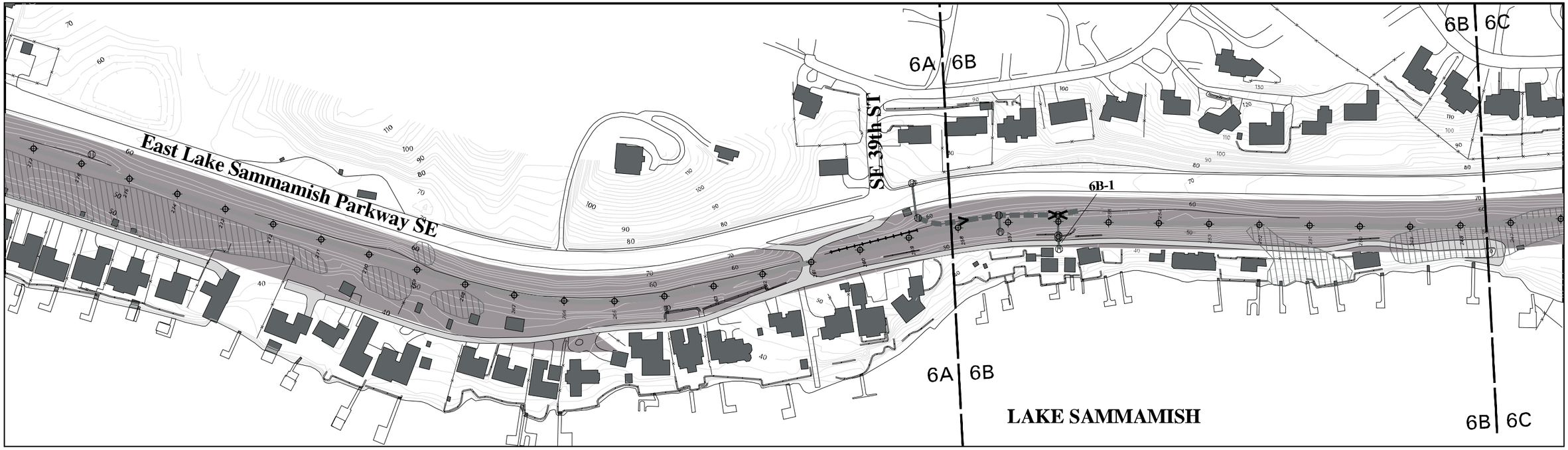

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0 200 400

Scale in Feet

- Right of Way
- Driveways
- Deciduous Trees
- Coniferous Trees
- Wetland
- Urban Matrix *
- Rail Bed
- Residential Path
- Stream
- Ditch
- Survey Station
- Culvert Inlet or Outlet

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Figure 3-G
East Lake Sammamish Trail
Draft Site Assessment Maps

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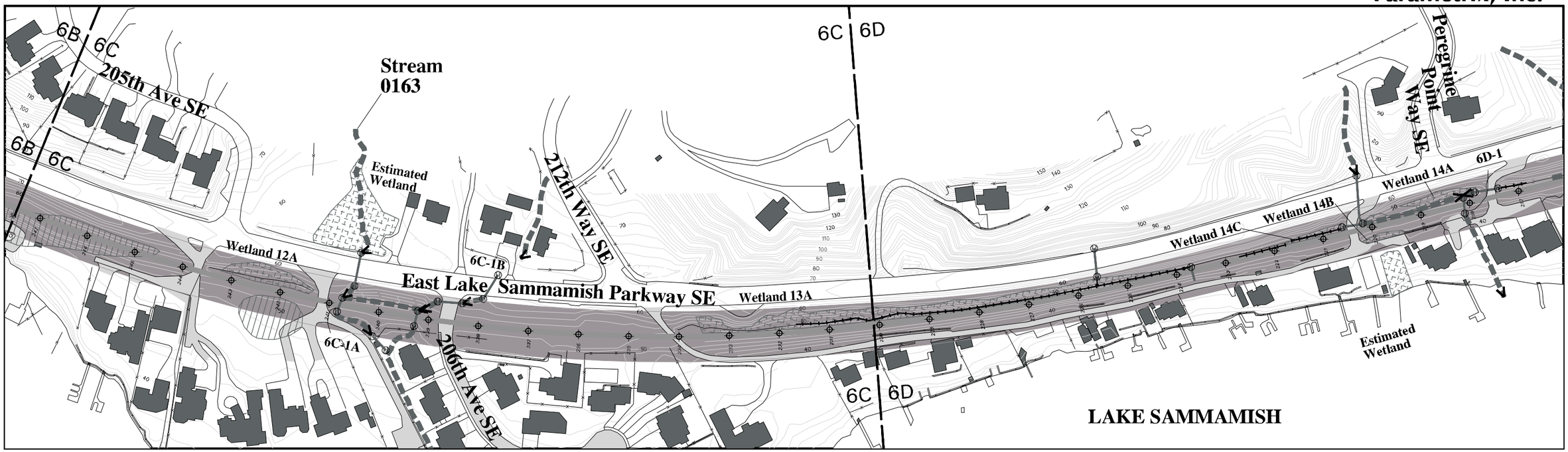

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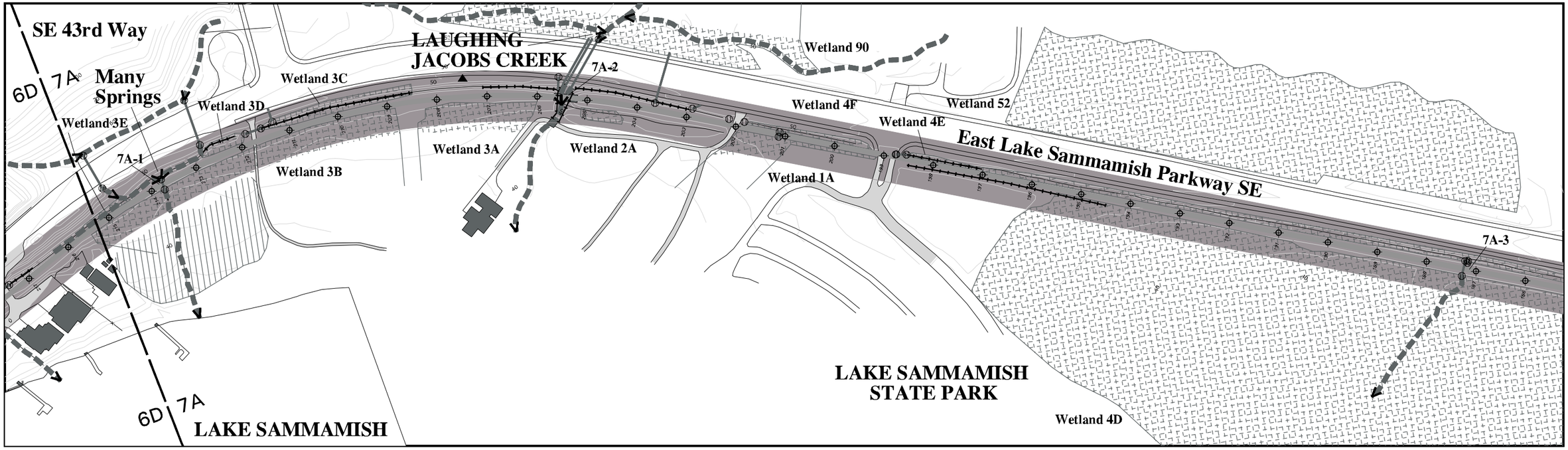

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0 200 400

Scale in Feet

- Right of Way
- Roads
- Driveways
- Deciduous Trees
- Wetland
- Urban Matrix *
- Rail Bed
- Stream
- Ditch
- Survey Station
- Unverified Culvert
- Culvert Inlet or Outlet

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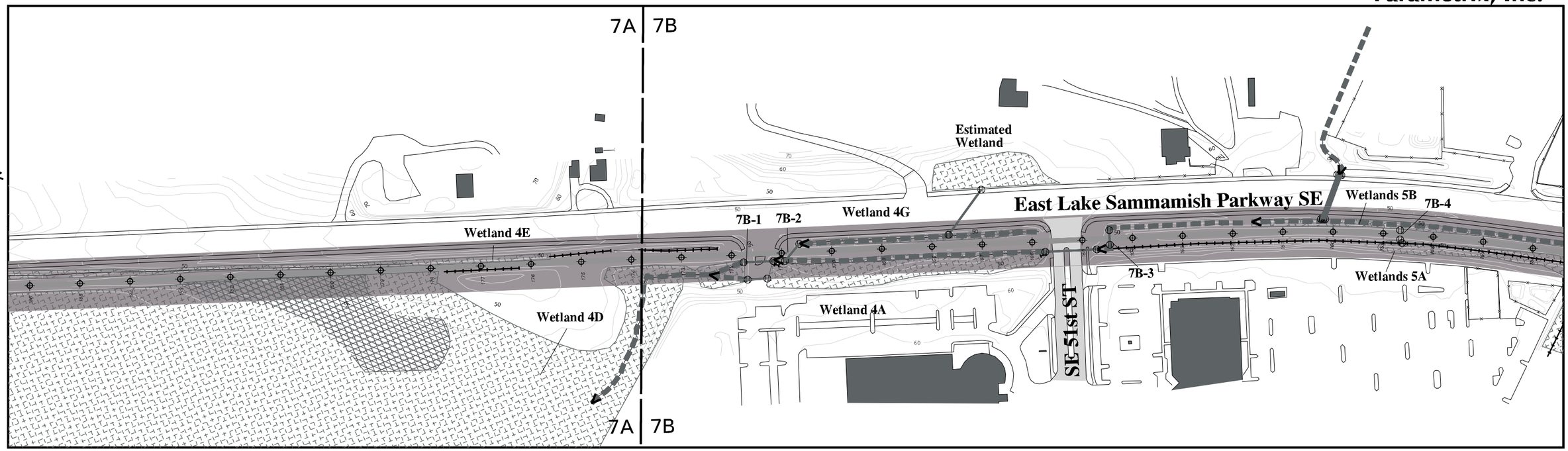
Figure 3-H
East Lake Sammamish Trail
Draft Site Assessment Maps

A



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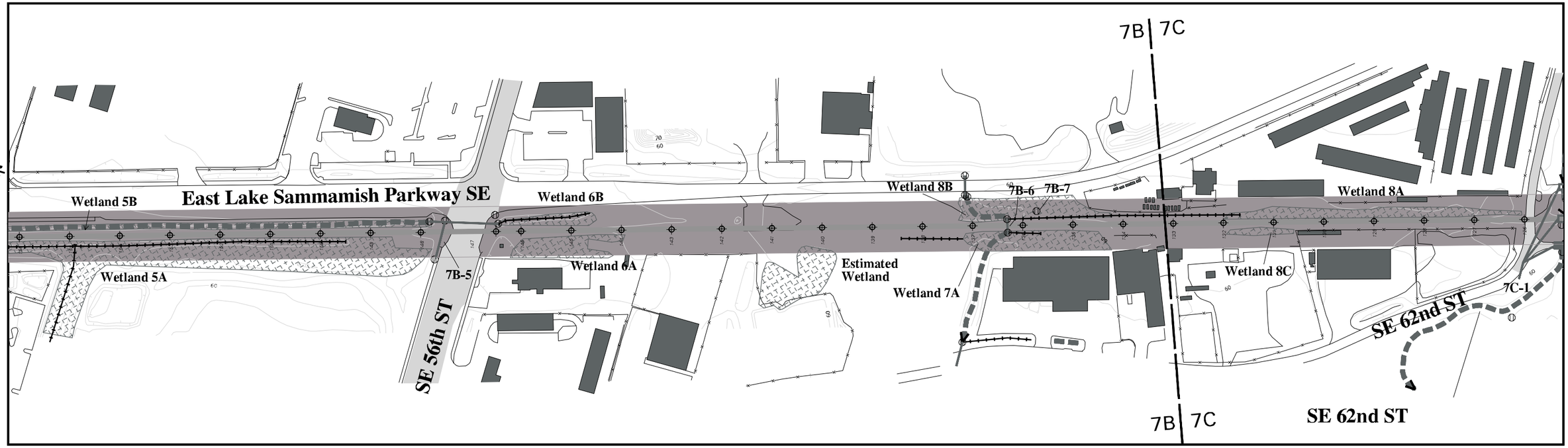

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0 200 400

Scale in Feet

- Right of Way
- Roads
- Grassy Field
- Wetland
- Urban Matrix *
- Rail Bed
- Stream
- Ditch
- Survey Station
- Culvert Inlet or Outlet

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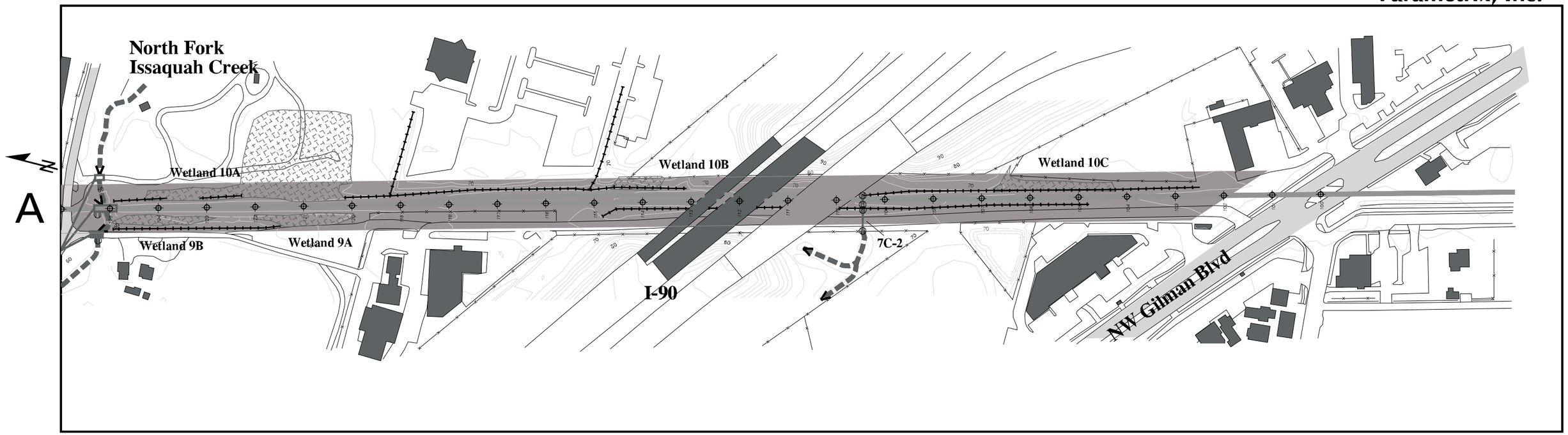
Figure 3-I
East Lake Sammamish Trail
Draft Site Assessment Maps



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0 200 400

Scale in Feet

Right of Way
Roads
Wetland
Urban Matrix *

Rail Bed
Stream
Ditch

Survey Station
Culvert Inlet or Outlet

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Figure 3-J
East Lake Sammamish Trail
Draft Site Assessment Maps

CHAPTER 4. COMMENTS AND COORDINATION

Input from the public and key stakeholders from agencies, organizations and tribes was actively sought and carefully considered in determining the development of a proposed *Interim Use Trail Plan* (King County, 1999a). During development of the *Interim Use Trail Plan*, King County solicited comments from the public through workshops and meetings, individual meetings with property owners, meetings with potential user groups, an e-mail response link on a project Internet Web site and voice-mail via a project telephone hotline. Input was sought from potential trail users and property owners adjacent to the trail; individual meetings with stakeholders will continue through the Master Plan process. Two workshops and one open house were held to gather public input on trail planning issues and draft mitigation concepts. Over 600 people attended the various meetings and public workshops with approximately 575 public comments received (King County, 1999a). The public record of these comments is included in Appendix E of the *Interim Use Plan*. A Citizens Advisory Group (CAG) was also convened to provide recommendations on the proposed trail. The 13 members, selected by the King County Parks System, advised the County on the Interim process and will continue their advisory role throughout the Master Plan process. The CAG comments are also included in Appendix E of the *Interim Use Plan*, (King County, 1999a).

In accordance with SEPA, a scoping period for the Draft EIS for the Proposed Action was conducted from November 4 to November 29, 1999. During this period, King County collected written comments and heard public testimony on the scope of the Draft EIS. On November 17, 1999, the County held a public scoping meeting at Inglewood Junior High School in Sammamish, Washington, which was attended by 78 people. Individual comment forms were available, a court reporter recorded verbal comments, and written comments were recorded on flip charts throughout the room. The County received hundreds of written comments during the scoping period. A meeting was held with the Snoqualmie Tribe, and County staff discussed the proposed project with the Cultural Council of the Muckleshoot Tribe. The Tulalip Tribe was sent information on the proposed project. The County also held workshops with permitting agencies and jurisdictions to identify their concerns. From January 2000 through June 2001, on a weekly basis King County staff maintained evening office hours in the project area to provide information and answer stakeholder questions and concerns. Project staff continue to meet on site with adjacent property owners on request.

Consultation coordination letters in compliance with Section 106 of the National Historic Preservation Act were sent out by FHWA on February 5, 2001 to the Tulalip, Muckleshoot, and Snoqualmie Tribes. No cultural resources of concern were identified.

The Draft SEPA EIS was published on May 19, 2000, and public comments were received through July 3, 2000. On June 20, 2000, a public hearing was held on the Draft EIS. A total of 145 oral testimonies were given and approximately 129 written testimonies were provided as a result of this public hearing. All oral and written comments were addressed as part of the Final EIS document produced as part of the SEPA review process.

Comments received during SEPA EIS scoping are summarized in Table 1.1. Many comments were also received prior to the SEPA scoping process, during the early phases of the *Interim Use*

Plan associated with permit applications submitted by the County. These comments are incorporated into the SEPA Draft EIS Scoping Summary (King County, 1999a).

The scoping comments summarized in Table 1.1 were used to focus this NEPA EA evaluation as well as the SEPA EIS. The complete scoping comments are available for review at King County Department of Construction and Facilities Management (DCFM). Careful efforts have been made to understand and incorporate all public concerns about the project into the Interim Use Trail environmental documentation.

Evaluations have been conducted consistent with SEPA and FHWA's NEPA requirements.

Availability of Documents Referenced in this EA

Seattle Public Library
Government Publications Department
1000 - 4th Avenue
Seattle, WA 98104-1193

Suzzallo Library
University of Washington Main Campus
Government Publications Department
Seattle, WA 98195-2900

Bellevue Library
111 - 110th Avenue NE
Bellevue, WA 98004

Redmond Library
15810 NE 85th
Redmond, WA 98052

Issaquah Library
120 East Sunset Way
Issaquah, WA 98027

Sammamish Library
825 – 228th Avenue NE
Sammamish, WA 98053

King County DCFM
500 - 4th Avenue, Room 320
Seattle, WA 98104

King County Parks System
2040 - 84th Ave SE
Mercer Island, WA 98040

CHAPTER 5. BIBLIOGRAPHY

49 CFR Chapter 10, Section 1152.1, Subpart C: Procedures Governing Notice, Applications, Financial Assistance, Acquisition for Public Use, and Trail Use.

AASHTO Task Force on Geometric Design. 1999. *Guide for the Development of Bicycle Facilities*. American Association of State Highway and Transportation Officials.

AASHTO. 1994. *A Policy on Geometric Design of Highways and Streets.* American Association of State Highway and Transportation Officials.

Anthony, R.G. and F.B. Isaacs. 1989. *Characteristics of bald eagle nest sites in Oregon.* Journal of Wildlife Management 53:148-159.

Association of American Railroads. 1994. *A Review of Toxicity Characteristic Leaching Procedure Testing of Railroad Crossties.* Report No. R-861. July 1994.

Aubry, K.B. and C.M. Raley. 1993. Wildlife habitat relationships in Washington and Oregon. Annual report, fiscal year 1993, on file at Pacific Northwest Research Station, Olympia, Washington.

Bagley, C.B. 1929. *History of King County, Washington*. S.J. Clarke Publishing, Chicago.

Biking with Kids, weber.u.washington.edu/~klange/kidbike.html.

Bradbury, A and B. Pfeifer. 1992. Lake Sammamish creel survey - 1982-1983. Part IV. Fisheries investigation of Lake Washington and Sammamish - 1980-1990. Washington Department of Fish and Wildlife. Unpublished draft report.

Brinson, M.M. 1993. *A hydrogeomorphic classification of wetlands, Technical Report WRP-DE-4*. U.S. Army Corps of Engineer Waterways Experiment Station, Vicksburg, Mississippi.

Brown, H.A., R.B. Bury, D.M. Darda, L.V. Diller, C.R. Peterson, and R.M. Storm. 1995. *Reptiles of Washington and Oregon*. Seattle Audubon Society. Seattle, Washington.

Brown, L. 1994. *On the zoogeography and life history of Washington's native char.* Washington Department of Fish and Wildlife, Rept. #94-04, Fish. Mgmt. Div. 41 p.

Bull, E.L. 1987. *Ecology of the pileated woodpecker in northeastern Oregon.* Journal of Wildlife Management 51(2):472-481.

Butler, R.W. 1995. *The patient predator: foraging and population ecology of the great blue heron (Ardea herodias) in British Columbia.* Occasional Paper Number 86. Canadian Wildlife Service, Ontario, Canada.

Calambokidis, J., S.M. Speich, J. Peard, G.H. Steiger, J.C. Cubbage, D.M. Fry, and L.J. Lowenstine. 1985. *Biology of Puget Sound marine mammals and marine birds: population health and evidence of pollution effects.* National Oceanic and Atmospheric Administration. Technical Memo NOS. OMA 18.

City of Issaquah. 1990. *Shoreline Master Program*. City of Issaquah, Issaquah, WA.

City of Issaquah. 1992. *Issaquah Area Wildlife and Recreational Trails Plan*. Prepared by City of Issaquah Parks and Recreation Department.

City of Issaquah. 1995, amended 1997. *Final Comprehensive Plan*. City of Issaquah Planning Department, Issaquah, WA.

City of Issaquah. 1995. Environmental Protection. Chapter 18.10. Issaquah Code.

City of Issaquah. 1995a. *City of Issaquah Urban Trails Plan* (Non-motorized Transportation). Prepared by the City of Issaquah Public Works Department.

City of Issaquah. 1999. Capital Facilities Amendments. Ordinance 2256 and 2257. Effective December 20, 1999.

City of Redmond. 1997. Sensitive Areas Chapter 20D.140. *Redmond Community Development Guide*.

City of Redmond. 1997a. *Redmond Community Development Guide*. City of Redmond, Redmond, WA.

City of Redmond. 1997b. *City of Redmond Comprehensive Plan*. Prepared by the City of Redmond.

City of Redmond. 1997c. *Parks, Recreation, and Open Space Plan (PRO Plan)*, prepared by the Department of Parks and Recreation.

City of Redmond. 1999. *Traffic Collision History Report–Midblock Collisions*. Prepared by the City of Redmond Traffic Engineering Department.

City of Sammamish. 1999. *Interim Sammamish Development Code*.

City of Seattle. 1987. *Evaluation of the Burke-Gilman Trail's Effect on Property Values and Crime.* Seattle Engineering Department, Office of Planning. Seattle, WA. May 1987.

Conklin, E. 1998. *Trail Mix: Congestion, convenience, sereneness: Ever-growing Burke-Gilman has it all*. Seattle PI.com getaways, located at http://www.seattle-pi.com/pi/getaways/041698/burk16.html as of 9/24/00.

Cordone, A. J. and D. W. Kelley. 1961. *The influences of inorganic sediment on the aquatic life of streams.* California Fish and Game 47: 189-228.

Cottingham Transportation Engineering. 1986. *Bikeway/Pedestrian Trail Corridor Study East Lake Sammamish Parkway*. Prepared for Engineering Services Division, Department of Public Works, predecessor of the King County Department of Transportation. King County, Washington.

Cowardin, L.M., V. Carter, F.C. Gotlet, and E.T. LaRoe. 1979. *Classification of Wetlands and Deepwater Habitats of the United States*. Government Printing Office, Washington D.C.

Craig, M.G. and Wake, C. 1993. *Turning the Blacktop Green. Established Bicycle Networks Across North America*. Accessed at http://www.sabronline.org/reports.cfm on 9/24/00.

Craine, Bessie Wilson. 1983. *Squak Valley*. Issaquah Historical Society.

Doherty, S. 1998. *Rail-Trails and Community Sentiment: A Study of Opposition to Rail-Trails and Strategies for Success.* Prepared for the Rails-to-Trails Conservancy.

ECONorthwest. 1998. *Analysis of the Financial Feasibility of the Proposed City of Sammamish*. Prepared by ECONorthwest with Nesbitt Planning and Management and Norton Arnold Janeway for the Washington State Boundary Review Board for King County.

Egan, R. 1978. *Salmon Spawning Ground Data Report, Progress Report No. 51*. Washington State Department of Fisheries, Olympia, Washington.

Electric Power Research Institute. 1992. *Pentachlorophenol-Treated Wood Poles and Crossarms: Toxicity Characteristic Leaching Procedure Results.* Report Summary EN 7062s. January 31, 1992.

Environmental Laboratory. 1987. *Corps of Engineers Wetland Delineation Manual.* Technical Report Y-87-1, Environmental Laboratory, Department of the Army, Waterways Experiment Station, Vicksburg, Mississippi.

Everest, F. H., R. L. Beschta, J. C. Scrivener, K V. Koski, J. R. Sedell, and C. J. Cederholm. 1987. *Fine sediment and salmonid production: a paradox*. Pages 98-142 *IN*: Salo and Cundy (1987).

Federal Highway Administration. 2001. *Guidance for Preparing and Processing Environmental and Section 4(F) Documents.* Accessed at http://www.fhwa.dot.gov/environment/nepa/ta6640.htm on September 13, 2001.

Feeney, S.J. 1997. *The Mohawk-Hudson Bike-Hike Trail and Its Impact on Adjoining Residential Properties.* Prepared for the Schenectady County Department of Planning, Schenectady, NY.

FEMA (Federal Emergency Management Agency). 1995. Flood Insurance Rate Map, King County, Washington and Incorporated Areas. [53033C0680 F, 53033C0687 F, and 53033C0685 F]. Washington D.C.

FEMA (Federal Emergency Management Agency). 1998. Flood Insurance Rate Map, King County, Washington and Incorporated Areas. [53033C0390 F]. Washington D.C.

Fish, E.J. 1981. *The Past at Present in Issaquah, Washington*. Pen Print, Inc., Port Angeles, WA.

Fish, H. 1976. *Waterways of Squak Lake.* Issaquah Press, August 4.

Gemperle, R. 1972. National Register Nomination Form for Dutch Windmill (45KI192H). On file at Washington State Office of Archaeology and Historic Preservation, Lacey.

General Accounting Office (GAO). 1989. Report to the Honorable Sam Brownback, US Senate, Surface Transportation: Issues Related to Preserving Inactive Rail Lines as Trails. GAO RCED-00-4, Washington, D.C.

Geo-Recon International Ltd. 1980. *Cultural Resource Reconnaissance Proposed Landmark on the Lake Development Redmond, Washington*. Seattle.

Geospatial & Statistical Data Center. 1993 crime data for King County, Washington. Available as of 10/12/99 at http://fisher.lib.virginia.edu/cgi-local/crimebin/old2.cgi.

Gibbons, D. R. and E. O. Salo. 1973. *An annotated bibliography on the effects of logging on fish of the western United States and Canada*. U.S. Forest Service, General Technical Report PNW-10.

Goetz, F. A. 1994. Distribution and ecology of bull trout (*Salvelinus confluentus*) in the Cascade Mountains. Master's Thesis. Oregon State University, Eugene, Oregon.

Greengo, R.E. and R. Houston. 1970. *Excavations at the Marymoor Site.* Department of Anthropology, University of Washington, Reports in Archaeology 4.

Gunther, E. 1981. *Ethnobotany of Western Washington*. Reprinted. University of Washington, Seattle. Originally published 1945, University of Washington Publications in Anthropology, Vol. 10, No. 1.

Haeberlin, H. and E. Gunther. 1930. The Indians of Puget Sound. *University of Washington Publications in Anthropology*. 4:1-84

Hall, T. J. 1984. The effects of fine sediment on salmonid spawning gravel and juvenile rearing habitat: a literature review. National Council of the Paper Industry for Air and Stream Improvement, Technical Bulletin 428, New York.

Healey, M.C. 1991. Life history of chinook salmon (Oncorhynchus tshawytscha). *In*: C. Groot and L. Margolis, eds. *Pacific Salmon Life Histories*. UBC Press, University of British Columbia, Vancouver, British Columbia.

Hendry, A.P. 1995. *Sockeye salmon (Oncorhynchus nerka) in Lake Washington: an investigation of ancestral origins, population differentiation, and local adaptation*. Master of Sci. Thesis, School of Fisheries, Univ. of Washington. Seattle, WA.

Hillman, T.W. and D.W. Chapman. 1989. *Abundance, growth and movement of juvenile chinook salmon and steelhead.* Summer and winter ecology of juvenile chinook salmon and steelhead trout in the Wenatchee River, Washington. Final Report. Chelan County PUD, Wenatchee, Washington.

History Link. 2000. *Monohan Beginnings.* At www.historylink.org, February 2000.

Hitchman, R.. 1985. *Place Names of Washington*. Washington State Historical Society, Tacoma.

Hynes, H.B.N. 1970. *The Ecology of Running Waters*. Univ. of Toronto Press. 555 pages.

ICBO (International Conference of Building Officials). 1997. *Uniform Building Code*. Structural Engineering Design Provisions, *Vol. 2.* Published by the International Conference of Building Officials.

Issaquah Historical Society. 2000. Issaquah Railway History Chronology. Located at http://www.issaquahhistory.org/depotchron.htm on February 4, 2000.

Justice, B. 1999. July 1999 Trolley Update. Located at http://www.issaquahhistory.org/trolleyupdate.htm as of February 4, 2000.

King County. 1971. *Urban Trails Plan*. Prepared by the Planning Department.

King County. 1975. *General Bicycle Plan*. Adopted by King County Council Motion 2420.

King County. 1977. *King County Shoreline Management Program*. Ordinance 3692, August 1977.

King County. 1990a. *Proposed Bear Creek Basin Plan.* King County Department of Public Works, Surface Water Management Division. Seattle, Washington. 117 pp.

King County. 1990b. *East Lake Sammamish Basin Conditions Report—Preliminary Analysis.* King County Department of Public Works, Surface Water Management Division. Seattle, Washington. 148 pp and Appendices.

King County. 1991. *King County Wetlands Inventory, 1990*. King County Environmental Division, Bellevue, Washington. Volumes 1: north and 2: east.

King County. 1992a. *King County Regional Trails Plan*. Prepared by Parks, Planning and Resources Department, Parks Division.

King County. 1992b. *East Sammamish Community Plan Update and Area Zoning*. Prepared by King County Planning and Community Development Division. Adopted by Ordinance 10847, June 1993.

King County. 1993a. *King County Nonmotorized Transportation Plan*. Prepared by the Department of Public Works, Roads Division, Transportation Planning Section.

King County. 1993b. *Sammamish River Corridor Conditions and Enhancement Opportunities*. King County Surface Water Management Division. Seattle, Washington.

King County. 1993c. King County Zoning Code, Title 21A. Adopted June 7, 1993.

King County. 1994a. *King County Comprehensive Plan*.

King County. 1994b. *East Lake Sammamish Basin: Watershed Management Committee: Basin and Nonpoint Action Plan.* King County Surface Water Management Division and Washington State Department of Ecology. Seattle, Washington.

King County. 1994c. *East Lake Sammamish Basin and Nonpoint Action Plan: Annual Report 1994 Water Year*. King County Surface Water Management Division. Seattle, Washington.

King County. 1994d. *Issaquah Creek Watershed Management Committee Proposed Basin and Nonpoint Action Plan*. King County Department of Public Works and Issaquah/East Lake Sammamish Watershed Management Committee. Seattle, Washington.

King County. 1995. *Environmentally Sensitive Areas*. Chapter 21A.24 King County Code.

King County. 1995a. Lake Sammamish Total Phosphorus Model. King County Department of Metropolitan Services; Water Pollution Control Department and King County Surface Water Management Division. Seattle, Washington.

King County. 1995b. *Technical Appendix: King County Park, Recreation and Open Space Plan*. Prepared by the Department of Parks and Recreation.

King County. 1996. *King County Parks, Recreation and Open Space Plan*. Prepared by: King County Department of Parks and Recreation, Seattle, WA.

King County. 1998a. *Lake Sammamish Water Quality Management Project Final Report*. Prepared by: King County Department of Natural Resources, Seattle, WA.

King County. 1998b. *King County Surface Water Design Manual.* King County Department of Natural Resources. Seattle, WA.

King County. 1998c. *East Lake Sammamish Parkway Traffic Noise Reduction Study (Draft).* Prepared by L. Korpi for the King County Department of Transportation.

King County. 1998d. King County Bicycling Guidemap. Prepared by King County Department of Transportation.

King County. 1999. King County Department of Public Works Accident Data Records.

King County. 1999a. *East Lake Sammamish Trail Interim Use and Resource Protection Plan, 7-28-99 Draft Report*. Prepared by King County Park System and Department of Construction and Facilities Management.

King County. 1999b. *East Lake Sammamish Trail Interim Use and Resource Protection Plan.* August 27, 1999 Draft Report, Appendix A: Wetland, Stream Drainage and Floodplain Report. King County Park System and Department of Construction and Facilities Management. Seattle, Washington.

King County. 1999c. Lake Sammamish Water Quality, Management Project. King County Department of Natural Resources Website: www.splash.metrokc.gov/wrl/waterres/lakes/SAMM.htm. Accessed December 27, 1999.

King County. 1999d. Drainage Complaint Database Query. King County Water and Land Resources Division: Drainage Services Section. Accessed in 1999. Seattle, WA.

King County. 1999e. *Draft King County Year 2000 Comprehensive Plan Update.* King County Office of Regional Planning. Seattle, WA.

King County. 1999f. *King County Annual Growth Report*. King County Office of Regional Planning. Seattle, WA.

King County. 1999g. *King County Zoning Atlas*. Ordinance 13672, December 16, 1999.

King County. 1999h. *Appendix E: Public Record of the East Lake Sammamish Trail Interim Use and Resource Protection Plan Draft Report*. Prepared by King County Park System and Department of Construction and Facilities Management, 7/28/99.

King County. 1999i. King County Statistical Profile. Located at www.metrokc.gov/exec/orpp/agr/agr99/kcstat99.pdf as of 2/7/00.

King County. 2000a. *Final Environmental Impact Statement, East Lake Sammamish Interim Use Trail and Resource Protection Plan.* Prepared by Parametrix, Inc., Adolfson Associates, Inc., and associated firms for King County Department of Construction and Facilities Management, August 25, 2000.

King County. 2000b. *East Lake Sammamish Trail Interim Use and Resource Protection Plan.* Prepared by Parametrix, Inc., November 2000.

King County. 2000c. *Historic and current status of kokanee in the Lake Washington basin. Discussion Draft.* March 13, 2000. Prepared by R2 Resource Consultants for King County Department of Natural Resources.

King County. 2000d. King County Park System Trails. Located at http://www.metrokc.gov/parks/atlas/regtrails.htm on 1/31/2000.

King County. 2001a. *King County Land Use Atlas*. Ordinance 13672, December 16, 1999.

King County. 2001b. Section 103 Culvert Inspection and Replacement. *In: East Lake Sammamish Trail Grounds Support Storm Drainage Maintenance Plan. November 2001.*

King County. year unknown. Burke-Gilman Trail (informational pamphlet). Prepared by Seattle Dept. of Parks and Recreation and Seattle Engineering Dept.

King County Park System. 1999. *Erosion and Sedimentation Control Plan and Pollution Prevention Plan*, East Lake Sammamish ROW Rail Salvage Project. March 30, 1999.

Larson, L.L. 1984. *Report on Archaeological and Historic Resources of the Skyport/Pickering Farm Property.* Issaquah, Washington. Blukis Onat Applied Sciences, Inc.

Layton, J. 2000. Lake Sammamish Living: Judy's Real Estate Statistics. Viewed at Http://www.lakesamm.com/judy/stats.asp on February 4, 2000.

Lewarch, D.E., L.L. Larson, and L.A. Forsman. 1995. Introduction. *In*: *The Archaeology of West Point*, edited by Lynn L. Larson and Dennis E. Lewarch.

Lindsay, Bob. 1992. Effects of jetboats on fish. Unpublished literature review and executive summary of effects. Oregon Department of Fish and Wildlife, Research and Development.

Livingston, S.A., C.S. Todd, W.B. Krohn, and R.B. Owen, Jr. 1990. *Habitat models for nesting bald eagles in Maine*. Journal of Wildlife Management 54(4):645-653.

Metro. 1987. *Lake Sammamish Water Quality Management Project: Technical Report*. Entranco Engineers. Seattle, Washington.

Michael R. Yantis Associates. 1995. *Noise Study: East Lake Sammamish Parkway Pavement*. Prepared for Agra Earth & Environmental.

Miglorie, J.A., CCR, Court Reporter. East Lake Sammamish Trail Public Scoping Meeting, November 17, 1999, Redmond, Washington.

Miller Murphy, M. 1992. *The Impact of the Brush Creek Trail on Property Values and Crime*. Environmental Studies and Planning Senior Project, Sonoma State University, Santa Rosa, CA.

Moore, R. 1994. *Conflicts on Multiple-Use Trails: Synthesis of the Literature and State of the Practice*. Federal Highway Administration and The National Recreational Trails Advisory Committee.

Moore, R., Graffe, A.R., and Gitelson, R.J. 1992. *The Impacts of Rail-Trails. A Study of User and Property Owners from Three Trails.* Penn State University and the National Park Service, accessed at http://www.ncrc.nps.gov/rtca/rtc/impact-b.htm.

Moritz, W.E. 1995. *Summary Report, Burke-Gilman/Sammamish River Trails, User Counts and Survey Results.* Human Powered Transportation, University of Washington, Seattle, WA.

Muckleshoot Indian Tribe Fisheries Department, Washington Department of Fish and Wildlife, and Suquamish Indian Tribe Fisheries Department. 1999. *Draft Lake Washington chinook salmon* (*Oncorhynchus tshawytscha*) *recovery plan*. Technical review draft. March 25, 1999.

Myers, J.M., R.G. Kope, G.J. Bryant, D. Teel, L.J. Lierheimer, T.C. Mainwright, W.S. Grant, F.K. Waknitz, K. Neely, S.T. Lindley, and R.S. Waples. 1998. *Status review of chinook salmon from Washington, Idaho, Oregon, and California*. U.S. Department of Commerce, NOAA Tech. Memo. NMFS-NWFSC-35.

National Association of Reversionary Property Owners. 1997a. The Burke-Gilman Trail and Property Values. Located at http://www.monontrail.com/docs/bg-study.htm on October 20, 1999.

National Association of Reversionary Property Owners. 1997b. *The Burke-Gilman Trail and Property Values: Explanation of Accompanying Spreadsheet on Certain Property Values*. Bellevue, WA. October 1997.

National Association of Reversionary Property Owners. 1997c. Property Rights Advocates, Property Owner's Rights on the Rails to Trails Issue, accessed on May 11, 2000 at http://www.halcyon.com/dick/.

National Marine Fisheries Service (NMFS). *1995 Endangered and threatened species; proposed threatened status for three contiguous ESUs of coho salmon ranging from Oregon through Central California*. Proposed Rule July 25, 1995. Federal Register 60(142):38011-38030.

National Marine Fisheries Service (NMFS). 1999. *Endangered and threatened species; threatened status for Southwestern Washington/Columbia River coastal cutthroat trout in Washington and Oregon, and Delisting of Umpqua River cutthroat trout in Oregon*. Federal Register 64(64):16397-16413.

Nelson, M.A. 1998. *Heritage Resource Investigations at the Proposed Lake Sammamish Heights Development, King County, Washington*. Prepared for Hinsdale Properties LLC by Northwest Archaeological Associates, Inc., Seattle.

Nelson, S.K. 1988. Habitat use and densities of cavity nesting birds in the Oregon coast ranges. Master's Thesis, Oregon State Univ. Corvallis, Oregon.

Newcombe, C. P. and J.O.T. Jensen. *Channel suspended sediment and fisheries: a synthesis for quantitative assessment of risk and impact*. No. Amer. J. Fish Management 16(4): 693-727.

Norman, L.K. 2000 *Results of Archaeological Monitoring and A Summary of Findings for the Lake Sammamish Heights Development*. Prepared for Hinsdale Properties LLC by Northwest Archaeological Associates, Inc., Seattle.

Oregon Department of Fish and Wildlife (ODFW). 1996. *Species at Risk: sensitive, threatened, and endangered vertebrates of Oregon*. Second edition. Portland, Oregon.

Oregon Department of Transportation. 1988. *A Feasibility Study for the Banks/Veronia Linear Park*. Prepared by Klein Consulting Engineers, Inc.; K.J. Won, AICP; and George Wm. Otten & Associates.

Parametrix. revised October 2001a. East Lake Sammamish Interim Use Trail Technical Information Report.

Parametrix. October 2001b. Stormwater Pollution Prevention Plan, Interim East Lake Sammamish Trail.

Parametrix. October 2001c. East Lake Sammamish Interim Use Trail Temporary Sediment and Erosion Control and Construction Monitoring Plan.

Parsons Brinckerhoff. 1998. *East Lake Sammamish Parkway Design Assessment Report*. Prepared for King County Department of Transportation.

Pfeifer, Bob. 1992. Fisheries investigations of Lakes Washington and Sammamish – 1980-1990. Part V. *Wild cutthroat and kokanee in Lakes Washington and Sammamish* (draft document). Washington Department of Fish and Wildlife.

Pflug, David E. 1981. *Smallmouth bass of Lake Sammamish: a study of their age and growth, food and feeding habits, population size, movement and homing tendencies, and comparative interactions with largemouth bass*. Master of Science Thesis. University of Washington, Seattle.

Preston, C. R., and R. D. Beane. 1993. *Red-tailed hawk (Buteo jamaicensis*). In: A. Poole and F. Gill (eds.). The Birds of North America, No. 52. The Academy of Natural Sciences , Philadelphia, Pennsylvania. The American Ornithologists' Union, Washington, D.C.

Rails-to-Trails Conservancy. 2000. Current Rail-Trail Statistics. Accessed at http://222.railtrails.org/stats.html on July 28, 2000.

Reimold, R.J. 1994. *Wetland functions and values*. Chapter 4, in Applied Wetlands Science and Technology. D. Kent. Lewis Publishers, Boca Raton, Florida.

Reiser, D. W. and T. C. Bjornn. 1979. *Influence of forest and rangeland management on anadromous fish habitat in the western United States and Canada*: 1. Habitat

requirements of anadromous salmonids. US Forest Service General Technical Report PNW-96.

Reppert, R.T., W. Sitleo, E. Stakhiv, L. Messman, and C. D. Meyers. 1979. *Wetlands values: concepts and methods for wetlands evaluation*. Research Report 79-R1 Institute for Water Resources, U.S. Army Corps of Engineers. Fort Bevoir, Virginia.

Rieman, B.E. and J.D. McIntyre. 1993. *Demographic and habitat requirements for conservation of bull trout. General Technical Report.* U.S. Forest Service Intermountain Research Station, Ogden, Utah. 38 p.

Robinson, J.M. 1986. *A Cultural Resource Survey of King County Project #200187 East Lake Sammamish Parkway Southeast*. Archaeological and Historical Services, Cheney.

Robinson, J.M. 1988. *A Cultural Resources Survey of SR 520: SR 901 to SR202, King County, Washington*. Archaeological and Historical Services Short Report DOT88-07, Cheney.

Ruby, R.H. and J.A. Brown. 1992. *A Guide to Indian Tribes of the Pacific Northwest*. University of Oklahoma Press, Norman.

Salo, E. O. and T. W. Cundy (eds.). 1987. *Streamside management: forestry and fishery interactions*. University of Washington Institute of Forest Resources Contribution 57.

Sandercock, F. K. 1991. Life history of coho salmon. Pages 396-445 in C. Groot and L. Margolis, editors. *Pacific salmon life histories.* UBC Press, University of British Columbia, Vancouver, British Columbia.

Save Lake Sammamish plus six co-petitioners. 2000. Petition to list kokanee *Oncorhynchus nerka* as endangered under the Endangered Species Act. 15 March 2000.

Scott, W. B. and E. J.Crossman. 1973. Freshwater fishes of Canada. Fishery Resource Board Canada. Bulletin 184. Ottawa, Ontario. 966 p.

Seeb, Jim and Lisa Wishard. 1977. *Genetic marking and mixed fishery analysis: the use of biochemical genetics in the management of Pacific salmon stocks.* Wash. Dept. of Fisheries, Olympia, WA. Service Contract No. 792.

Shuford, W.D. 1993. Red-tailed hawk. *In*: W.D. Shuford (ed.). *The Marin County Breeding Bird Atlas: A Distributional and Natural History of Coastal California Birds*. California Avifauna Series1. Bushtit Books, Bolinas, California.

Smith, M.R., P.W. Mattocks, Jr., and K.M. Cassidy. 1997. *Breeding Birds of Washington State.* Volume 4. *In*: K. Cassidy, C.E. Grue, M.R. Smith, and K.M. Dvornich (eds.), Washington State Gap Analysis – Final Report. Seattle Audubon Society Publications in Zoology No. 1, Seattle, Washington.

Spier, L. 1936. *Tribal Distribution in Washington*. American Anthropological Association, General Series in Anthropology No. 3.

Sporting Goods Manufacturers Association (SGMA) and the USDA Forest Service. 1995. Emerging Markets for Outdoor Recreation in the United States. Located at http://www.outdoorlink.com/infosource/nsre on June 30, 2000.

Stalmaster, M.V. 1987. *The Bald Eagle*. Universe Books, New York, New York.

Stein, A.J. 1998. Redmond – Thumbnail History. At www.historylink.org, February 2000.

Surface Transportation Board. 1998. *Decision and Notice of Interim Trail Use or Abandonment.* Surface Transportation Board, Washington, D.C.

Suttles, W. and B. Lane. 1990. Southern Coast Salish. *In*: Northwest Coast. Wayne Suttles, ed. pp. 485-502. *Handbook of North American Indians*, Vol. 7, W.C. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.

Swanton, J.R . 1978. *Indian Tribes of Washington, Oregon, and Idaho*. Reprinted. Ye Galleon Press, Fairfield, Washington. Originally published in 1952 as Bulletin 145 of the Bureau of American Ethnology, Smithsonian Institution, Washington D.C.

The Conservation Fund and Colorado State Parks. 1995. *The Effect of Greenways on Property Values and Public Safety.* A Joint Study by the Conservation Fund and Colorado State Parks, State Trails Program. Denver, Colorado. November 1995.

Tracy, T. and H. Morris. 1998. *Rail-Trails and Safe Communities: Experience on 372 Trails*. In cooperation with National Park Service Rivers, Trails and Conservation Assistance Program. Prepared for the Rails-to-Trails Conservancy.

United Kingdom Creosote Council. 2000. Creosote: The Facts and the Fiction. http://www.creosote.co.uk/cr2.htm. January 24, 2000.

United States Census Bureau. 2001. American Fact Finder. Race (2000) and income (1990) data located at http://factfinder.census.gov/servlet/BasicFactsServlet and accessed on November 27, 2001.

United States Code Annotated (USCA). Title 16, Conservation, Chapter 27- National Trails System.

United States Court of Federal Claims. Filed January 14, 2000. Nos. 93-126L, 93-134L, 98-176L. Maurice L. and Delores J. Glosemeyer vs. the United States of America. Viewed at http://www.contractss.ogc.doc.gov/fedcl/opinions/2000opin/98-176L on February 16, 2000.

United States Department of Agriculture. 1996. *Standard Specifications for Construction and maintenance of Trails*. Prepared by the Forest Service Engineering Staff.

United States Environmental Protection Agency. 1971. *Construction Equipment*. U.S. Department of Commerce, U.S. Environmental Protection Agency.

United States Fish and Wildlife Service. 1986. *Recovery Plan for the Pacific bald eagle.* USDI Fish and Wildlife Service, Portland, Oregon.

United States Fish and Wildlife Service. 1989a. National Wetland Inventory, U.S. Fish and Wildlife Service. Issaquah, Washington.

United States Fish and Wildlife Service. 1989b. National Wetland Inventory, U.S. Fish and Wildlife Service. Redmond Quadrangle, Washington.

United States Fish and Wildlife Service. 1998. Endangered and threatened wildlife and plants; proposal to list the Coastal Puget Sound, Jarbridge River, and St. Mary-Belly River population segment of bull trout as threatened species. U.S. Fish and Wildlife Service. Proposed Rule June 10, 1998. Federal Register 63 (111):31693-31710.

United States Fish and Wildlife Service. 1999. Endangered and threatened wildlife and plants; Determination of threatened status for bull trout in the coterminous United States; Final Rule. November 1, 1999. U.S. fish and wildlife Service. Federal Register 64 (210):58910-58931.

United States Surveyor General. 1860. General Land Office Survey Map, Township 24 North, Range 6 East, Willamette Meridian. On file at the Washington State Department of Natural Resources, Olympia.

United States, Code, Title 49, Transportation, Chapter 105, Jurisdiction, Section 10502. Authority to exempt rail carrier transportation.

United States, Code, Title 49, Transportation, Chapter 109, Licensing, Section 10904. Offers of financial assistance to avoid abandonment and discontinuance

University of North Carolina Highway Safety Research Center. 1996. *Trail Intersection Design Guidelines*. Chapel Hill, NC.

Washington Department of Fish and Wildlife. 1991. *Management recommendations for Washington's priority habitat and species.* Olympia, Washington.

Washington Department of Fish and Wildlife. 1993a. *Status of the western pond turtle (Clemmys marmorata) in Washington.* Olympia, Washington.

Washington Department of Fish and Wildlife. 1993b. *Management recommendations for the red-tailed hawk (Buteo jamaicensis).* Mill Creek, Washington.

Washington Department of Fish and Wildlife. 1998. *1998 Washington State salmonid stock inventory*. Appendix: Bull trout and Dolly Varden. Washington Department of Fish and Wildlife. Olympia, Washington. 437p.

Washington Department of Fish and Wildlife. 1999b. *Management recommendations for Washington's priority species, Volume IV: birds.* Olympia, Washington.

Washington Department of Fish and Wildlife (WDFW). 2000. Priority Habitats and Species Lists. http://www.wa.gov/wdfw/hab/phsvert.htm#fish

Washington Department of Fisheries (WDF), Washington Department of Wildlife, and Western Washington Treaty Indian Tribes. 1993. 1992 Washington state salmon and steelhead stock inventory (SASSI): summary report. Washington Department of Fisheries, Olympia, Washington. 212 p.

Washington Department of Fisheries. Washington Department of Wildlife, and Western Washington Treaty Indian Tribes. 1993. *1992 Washington state salmon and steelhead stock inventory (SASSI): summary report.* Washington Department of Fisheries, Olympia, Washington. 212 p.

Washington State Department of Ecology. 1992. *Stormwater Management Manual for Puget Sound Lowlands*.

Washington State Department of Ecology. 1993. *Washington State Wetland Rating System, Western Washington*, Second Edition. Publication #93-74. Olympia, Washington.

Washington State Department of Ecology. 1994. *East Lake Sammamish Basin-watershed Management Committee Basin and Nonpoint Action Plan.* Washington Department of Ecology, Olympia.

Washington State Department of Ecology. 1997. *Washington State Wetland Identification and Delineation Manual*, Publication #96-94. Olympia, Washington.

Washington State Department of Ecology. 1998. 1998 303(d) List of Threatened and Impaired Water Bodies: WRIA 08 Cedar-Sammamish. Washington State Department of Ecology. Bellevue, Washington.

Washington State Department of Ecology. 1998. *State Environmental Policy Act Handbook*. Publication #98-114.

Washington State Department of Transportation. 1997. *Design Manual.* Olympia, Washington.

Waterman, T.T. ca. 1920. Puget Sound Geography. Unpublished manuscript on file Northwest Collection, Allen Library, University of Washington, Seattle.

Waters, Thomas F. 1995. Sediment In Streams. Sources, Biological Effects, and Control. Amer. Fisher. Soc. Monograph 7. AFS, Bethesda, MD. 251 pp.

Weitkamp, L.A., T.C. Mainwright, G.J. Bryant, G.B. Milner, D.J. Teel, R.G. Kope, and R.S. Waples. 1995. *Status review of coho salmon from Washington, Oregon, and California.* U.S. Department of Commerce. NOAA Technical Memo NMFS-NWFSC-24.

White, R.J. 1999. An inspection of salmonid stream crossings on the proposed East Lake Sammamish Trail. (Provided in public scoping comments for the EIS) Edmonds, WA.

Williams, R.W., R. Laramie, and J.J. Ames. 1975. *A catalog of Washington streams and salmon utilization*, Volume 1, Puget Sound. Washington Department of Fisheries. Olympia, Washington.

Wishard, Lisa. 1980. *Stock identification of Pacific salmon in western Washington using biochemical genetics.* Wash. Dept. of Fisheries, Olympia, WA. Service Contracts No. 1176 and 1276.

Wydoski, R.S. and R.R. Whitney. 1979. *Inland fishes of Washington*. University of Washington Press, Seattle, Washington.

PERSONAL COMMUNICATIONS

Altenburg, D. 2000. Redmond Fire Department, personal telephone communication.

Baranzini, R. 2000. Personal telephone communications. Chief, Sammamish Police Department.

Benson, R. 2000. Lake Sammamish State Park Ranger, personal telephone communication.

Carolan, E. 2000. Redmond Fire Department, personal telephone communication.

Department of Natural Resources. 2000. Agency correspondence from Sandy Swope-Moody, Environmental Coordinator, Natural Heritage Program. Letter dated March 8, 2000.

Eksten, T. 2000. King County Department of Parks and Recreation. Personal communication, telephone conversation with Tina Loucks, Adolfson Associates.

Eychaner, Carol. 1999. Personal communication. Scoping Comments on Draft East Lake Sammamish Trail Interim Use and Resource Protection Plan.

Fisher, L. 2000. Personal communication of February 14, 2000 regarding anadromous and resident salmonids. Fish Biologist, Washington Department of Fish and Wildlife.

Fisher, Larry. 2000. WDFW habitat biologist. Personal communication with Bob Pfeifer on July 25, 2000.

Foley, Steve. 2000. WDFW fishery biologist. Personal communication with Bob Pfeifer on July 24, 2000.

Girts, David. 2000. Personal communication of February 17, 2000 regarding crime on and along the Burke-Gilman Trail. Sergeant, University of Washington Police Department.

Gorremans, L. 2000. City of Redmond Parks and Recreation, personal telephone conversation.

Kostal, K. 2000. King County Parks Maintenance (Marymoor Park), personal telephone conversation. King County, Washington.

Kozar J., Issaquah Police Commander. 1999. Issaquah Police Department. Personal telephone communication, October, 1999.

Marelli, S. 2000. King County Department of Parks and Recreation. Personal communication, telephone conversation with Tina Loucks, Adolfson Associates.

Mathes, Matt. 2000. Senior Planner, City of Sammamish. Personal communications, fax to Deron Lozano, Adolfson Associates, Inc.

Morgan, T. 1999. Personal telephone conversation. Commander, Redmond Police Department.

Negri, S. 2000. Personal communication of January 4, 2000 with Julie Grialou, Parametrix, Inc. Staff biologist, Washington Department of Fish and Wildlife, Mill Creek, Washington.

Negri, S. 2000. Personal communication of January 4, 2000. Staff biologist, Washington Department of Fish and Wildlife, Mill Creek, Washington.

Nelson, Meg. 1994. Letter Report to Donna Barlow, City of Issaquah. Northwest Archaeological Associates, Inc.

Parametrix, Inc. 1999. Letter from Sarah Belway and Dwight Miller to Jennifer Knauer, King County Parks System. October 4, 1999.

Parametrix, Inc. 1999. Memorandum from Sarah Belway to Jennifer Knauer, King County Parks System. August 18, 1999.

Parametrix, Inc. 1999. Site visit in December 1999.

Potter, D. 2000. Personal telephone conversation with Tina Loucks, Adolfson Associates, Inc. on July 31, 2000.

Sheppard, B. 2000. Personal Communication with Bruce Sheppard, Manager of Environmental Remediation, Burlington Northern Santa Fe Railroad Company, Seattle, Washington. January 25, 2000.

Thompson, P. 2000. Personal communication of January 12, 2000. Staff biologist, Washington Department of Fish and Wildlife, Mill Creek, Washington.

Washington Department of Fish and Wildlife. 1999a. Letter to Julie Grialou documenting priority species and habitats in the vicinity of the East Lake Sammamish trail corridor.

Wilson, M. 2000. Personal communication of March 20, 2000. City Manager for the City of Sammamish.

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Hank Gobin
Tulalip Tribes
Cultural Resources Committee
6700 Totem Beach Road
Marysville, WA 98271

John Daniels, Jr., Chairman
Muckleshoot Tribe
39015 - 172nd Avenue SE
Auburn WA 98092

Donna Hogerhuis, Director
Cultural Resources Committee
Muckleshoot Tribe
39015 - 172nd Avenue SE
Auburn WA 98092

Ernie Combs
WSDOT
P.O. Box 47331
Olympia WA 98504-7331

Elizabeth Healy
Federal Highway Administration
Washington Division Office
Suite 501, Evergreen Plaza
711 South Capitol Way
Olympia WA 98501-1284

DISTRIBUTION LIST - NOTICE OF EA AVAILABILITY

Washington State Dept of Ecology
Northwest Office
Enforcement Section
3190-160th Ave SE
Bellevue, WA 98008

Puget Sound Energy
P.O. Box 90868, Mercer 04S
Bellevue, WA 98009-0868

Ted Muller, Program Supervisor
Priority Habitat and Species Section
Washington Dept. of Fish and Wildlife
16018 Mill Creek Blvd.
Mill Creek, WA 98012

Issaquah Press
45 Front Street South
Issaquah, WA 98027

Robert Schumacher
11414 - 105th Court Northeast
Kirkland, WA 98033

In addition to the names and addresses provided above, a Notice of EA Availability has been sent to all landowners located within 500 feet of the boundary of the East Lake Sammamish Interim Use Trail, and those people who gave comment during the scoping process.

Public Access Locations

Bellevue Library
Attn: Cheryl Standley, Librarian
Documents Department
111 - 110th Avenue NE
Bellevue, WA 98004

Redmond Library
Documents Department
15810 NE 85th
Redmond, WA 98052

Issaquah Library
Documents Department
120 East Sunset Way
Issaquah, WA 98027

Sammamish Library
Attn: John Shealler
Documents Department
825 – 228th Avenue NE
Sammamish, WA 98053

King County DCFM
500 - 4th Avenue, Room 320
Seattle, WA 98104

King County Parks System
2040 - 84th Ave SE
Mercer Island, WA 98040

APPENDIX A
EARTH AND GROUNDWATER

EARTH AND GROUNDWATER

Affected Environment

This section describes the existing geologic conditions (topography, soils, groundwater, and associated hazards) that may affect or be affected by the proposed East Lake Sammamish Interim Use Trail improvements. The Geology Technical Back-up (Geology Appendix, King County, FEIS, 2000a) includes maps of surficial geology and geologic hazards and a table summarizing the existing slope and geologic conditions for each trail segment.

Topography and Geology

The proposed project corridor is located in the central portion of the Puget Sound Basin, an elongated, north-south trending depression situated between the Olympic Mountains and Cascade Range in Western Washington. The existing topography, surficial geology, and hydrogeology in the project area are heavily influenced by past glacial activity. The topography is dominated by a series of north-south trending ridges and large troughs formed by glacial activity. The major troughs are now occupied by Puget Sound, Lake Washington, Lake Sammamish, and other large water bodies. Geology in the region includes a thick sequence of overconsolidated glacial and unconsolidated non-glacial soils overlying bedrock.

The project corridor traverses variable geologic conditions along the eastern slope of the Lake Sammamish trough (trail Segments 2 through 6). This slope has a topographic relief of approximately 400 feet from the Sammamish Plateau on the east side to Lake Sammamish on the west. The northern and southern ends of the corridor traverse unconsolidated alluvium along flat-lying plains. The elevation of the corridor lies between approximately 10 to 30 feet above Lake Sammamish.

The Uniform Building Code (ICBO, 1997) defines the Puget Sound region as Seismic Zone 3, which represents an area susceptible to moderately high seismic activity. Since the 1850's, over 25 earthquakes of magnitude 5.0 or greater have occurred in the Puget Sound region. In addition to the recorded earthquakes, evidence suggests that a major earthquake occurred about 1,100 years ago on the Seattle Fault. Evidence also suggests that large subduction zone earthquakes (magnitude 8 to 9) occur along the Washington coast. The geologic record suggests five or six subduction zone events may have occurred over the last 3,500 years; the most recent was about 300 years ago.

Geologic Hazards

Geologically hazardous areas are defined as areas that are susceptible to damage from erosion, sliding, earthquake, or other geologic events. Washington's Growth Management Act (GMA) (Chapter 36.70A RCW) requires all cities and counties to identify critical areas within their jurisdictions and to formulate development regulations for their protection. The cities of Redmond and Issaquah, as well as King County, have each developed Geologically Hazardous Areas Ordinances and accompanying maps or folios. (The newly incorporated City of

Sammamish refers to the King County Sensitive Areas maps at present.) In general, these ordinances require that detailed geotechnical studies be prepared to address specific standards relating to site geology and soils, seismic hazards, and facility design.

Figures A-1 through A-10 show the approximate locations of the identified geologic hazard areas relative to the project corridor. The most notable hazard areas include landslide and erosion hazards along trail Segments 2 through 6, and potential seismic liquefaction areas in Segments 1 and 7. Affects of the hazard areas relative to the project alternatives are discussed in the Impacts section below.

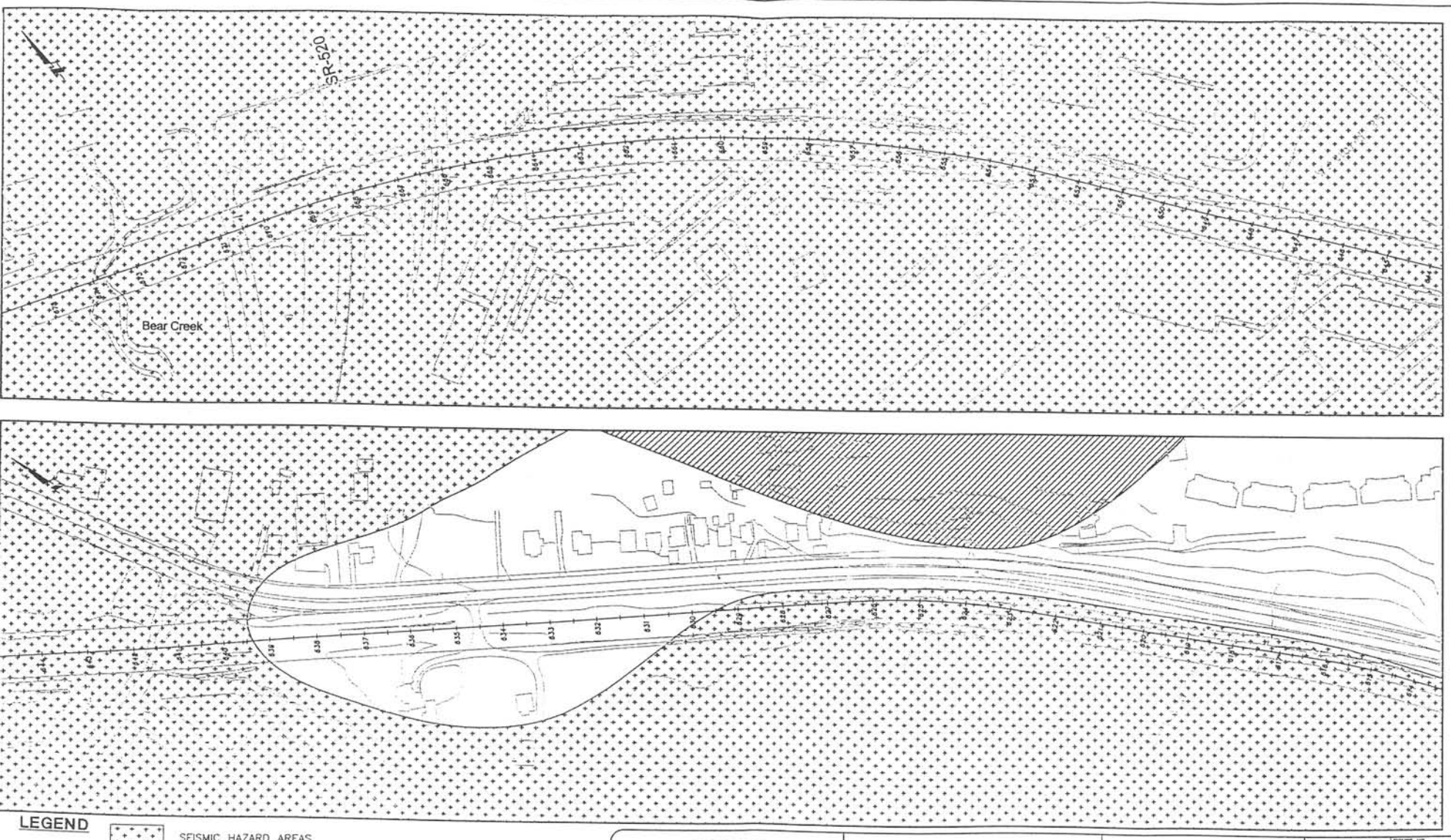
Soils and Sediments

Surface and subsurface soils in the plains at the north and south ends of Lake Sammamish (Segments 1 and 7) consist of alluvium and lake deposits. Soils along hillsides (Segments 2 through 6) typically consist of overconsolidated glacial deposits, overlain by variable thicknesses of colluvium (slope deposits) and locally by alluvium.

Erosion potential along the project corridor varies with surficial geology and soil type, topography, occurrence of groundwater seepage and surface runoff, and the built environment. The greatest erosion potential appears to be along the existing cut slopes of the railbed, which comprise approximately 16 percent of the corridor length.

Groundwater

Variations in geology and topography along the alignment result in variable groundwater conditions. Groundwater in the alluvial plains at the north and south ends of Lake Sammamish occurs at shallow levels within alluvial deposits and is interconnected with the lake. Groundwater levels in the alluvium and water levels in the lake rise and fall according to season. Along the hill slopes above the alignment, groundwater seeps may discharge from perched groundwater layers to surface water bodies flowing into Lake Sammamish. No seepage, however, was observed along the existing railroad cuts during site reconnaissance in January 2000. Shallow, perched groundwater occurs above relatively impermeable glacial deposits that contain substantial portions of silt or clay, such as till, transitional beds, and Olympia beds (see Geology Appendix, King County, FEIS, 2000a, for unit descriptions). Glacial outwash units consisting of higher percentages of coarse-grained materials tend to form aquifers which occur both above and below the impermeable glacial deposits. Local water well logs obtained from Washington Department of Ecology reveal that most wells in the vicinity of the project alignment obtain groundwater from depths greater than 100 feet, and penetrate confined aquifers below impermeable deposits. These aquifers are separated from surface runoff by one or more aquitards (impervious units). Substantial interconnection between surface water at the lake shore and groundwater would not be expected to extend below the upper 20 feet of soil. Since the trail corridor is near the lake shore and only 10 to 30 feet higher than the lake, it is in an area of groundwater discharge from the hill slope (and Sammamish Plateau) toward the lake.



LEGEND

SEISMIC HAZARD AREAS

LANDSLIDE HAZARD AREAS

0' 100' 200' 400'

REFERENCE: Base map provided by PARAMETRIX, INC.

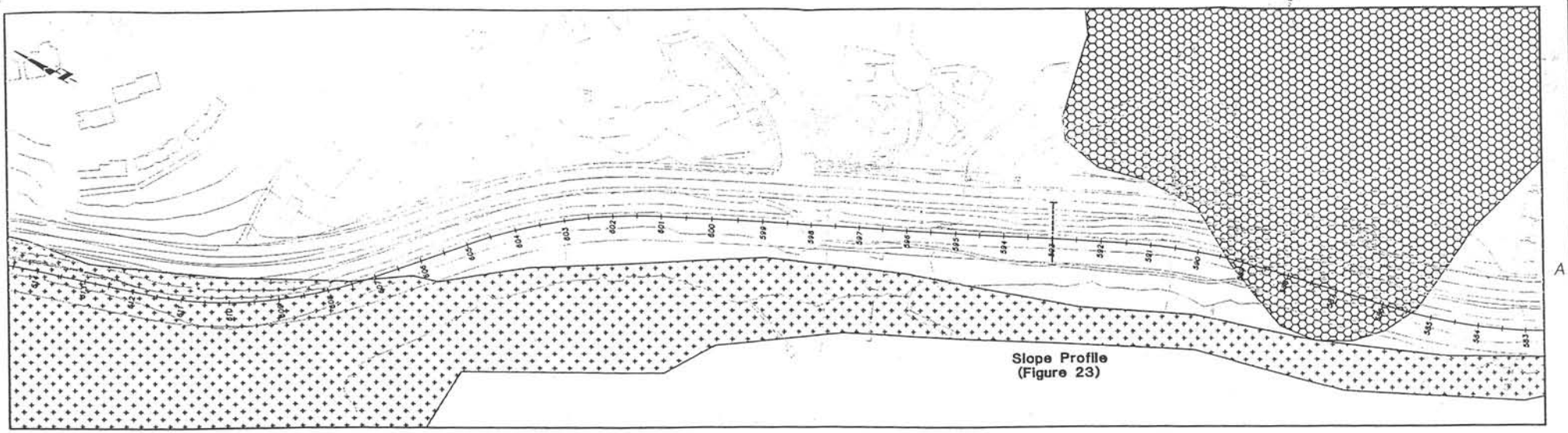
C:\1PROJECTS\99\99179\99179014.DWG

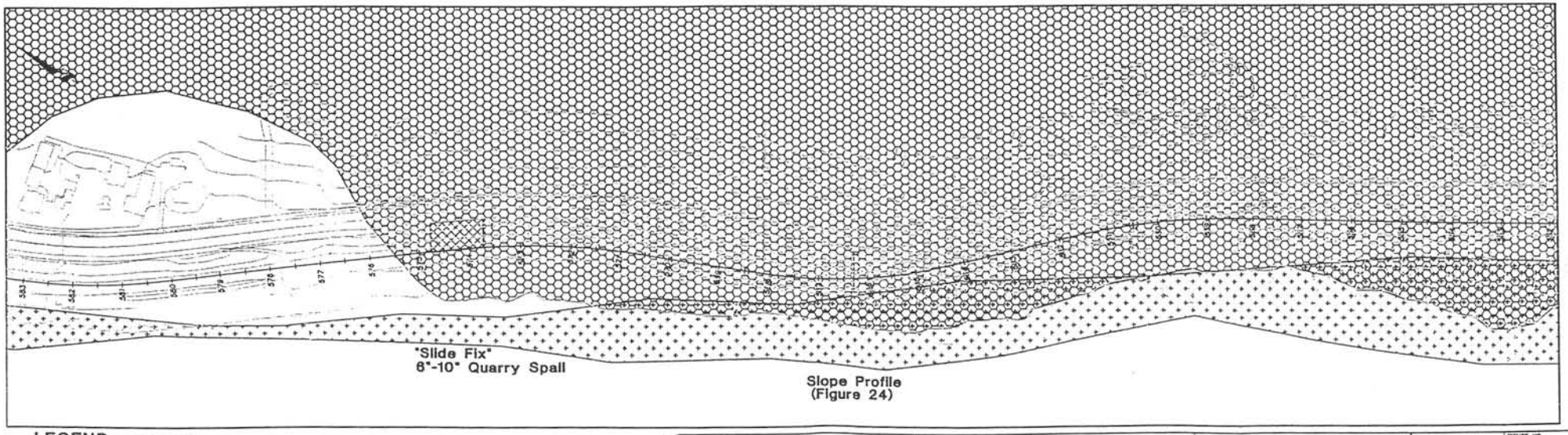
HWA GEOSCIENCES INC.

EAST LAKE SAMMAMISH TRAIL
KING COUNTY, WASHINGTON

SITE PLANS WITH
GEOLOGIC HAZARDS

DRAWN BY HAC	FIGURE NO. A - 1
CHECKED BY BWT	
DATE 1.26.00	PROJECT NO. 99179





LEGEND

SEISMIC HAZARD AREAS

EROSION HAZARD AREAS

0' 100' 200' 400'

REFERENCE: Base map provided by PARAMETRIX, INC.

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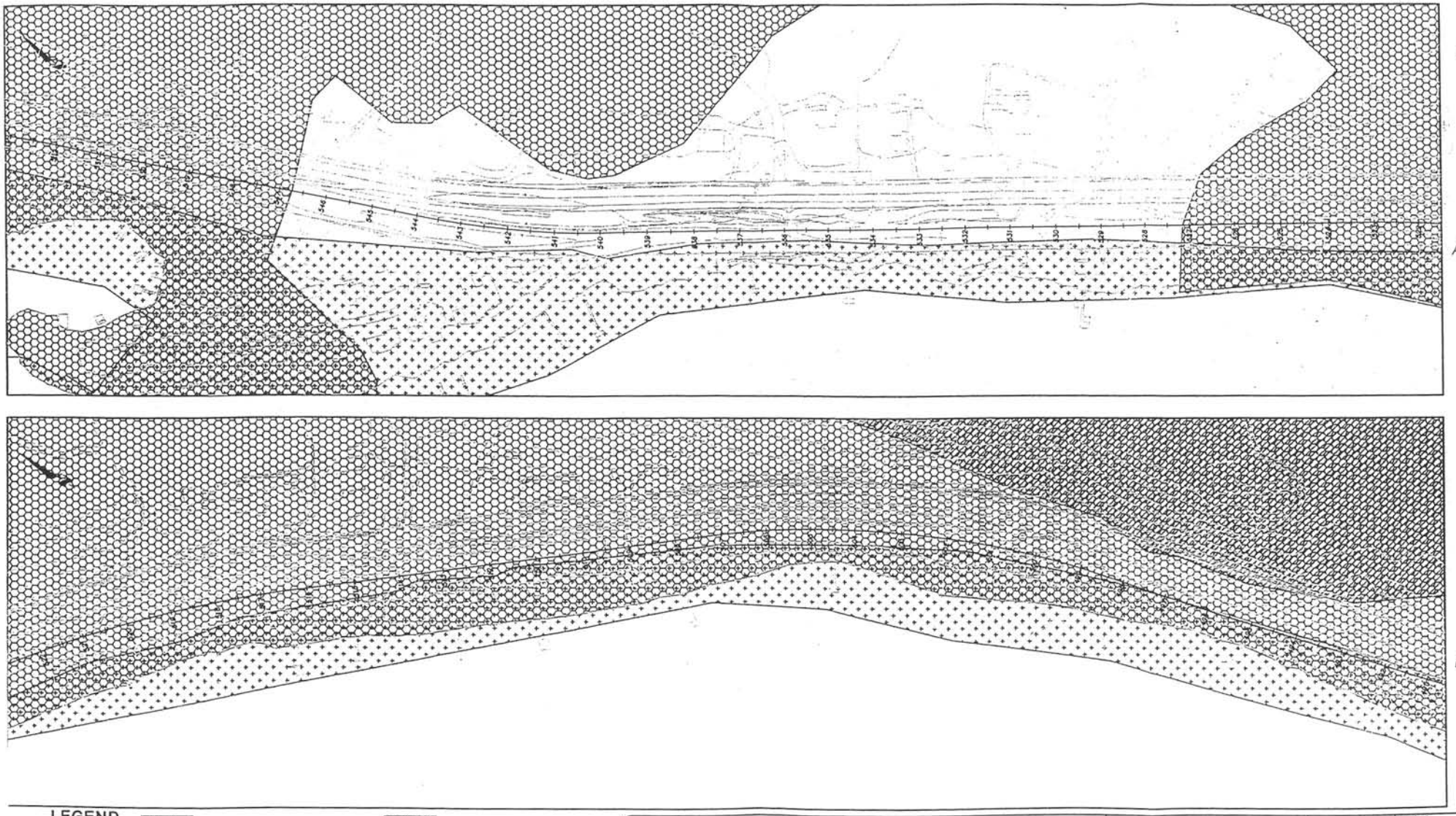
HWA GEOSCIENCES INC.

EAST LAKE SAMMAMISH TRAIL
KING COUNTY, WASHINGTON

SITE PLANS WITH
GEOLOGIC HAZARDS

DRAWN BY HAC	FIGURE NO. A - 2
CHECKED BY BWT	
DATE 1.26.00	PROJECT NO. 99179



LEGEND

SEISMIC HAZARD AREAS

LANDSLIDE HAZARD AREAS

EROSION HAZARD AREAS

0' 100' 200' 400'

REFERENCE: Base map provided by PARAMETRIX, INC.

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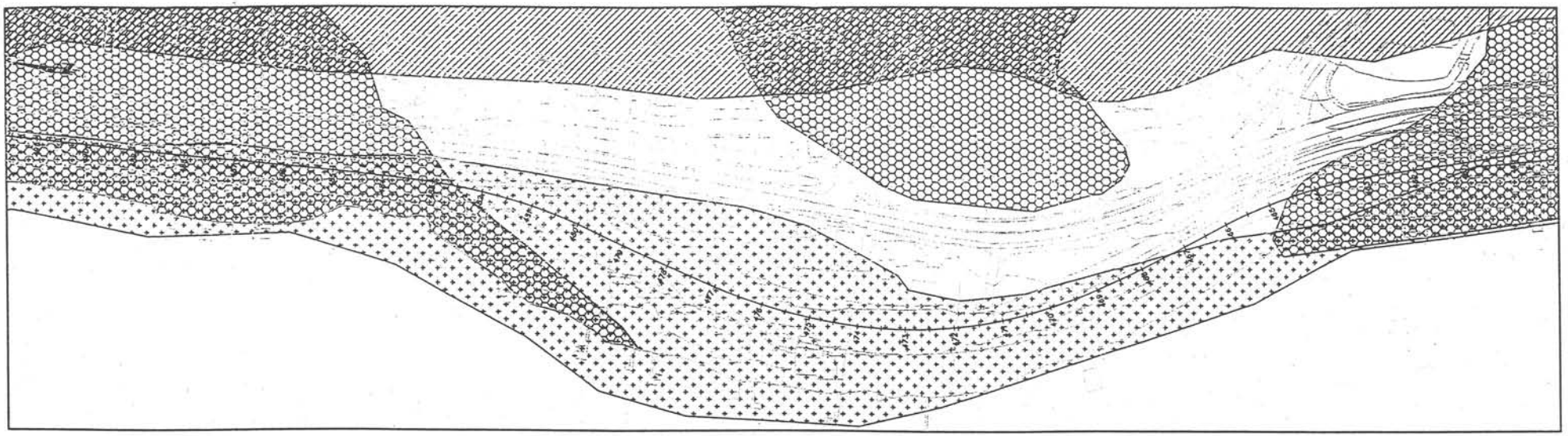
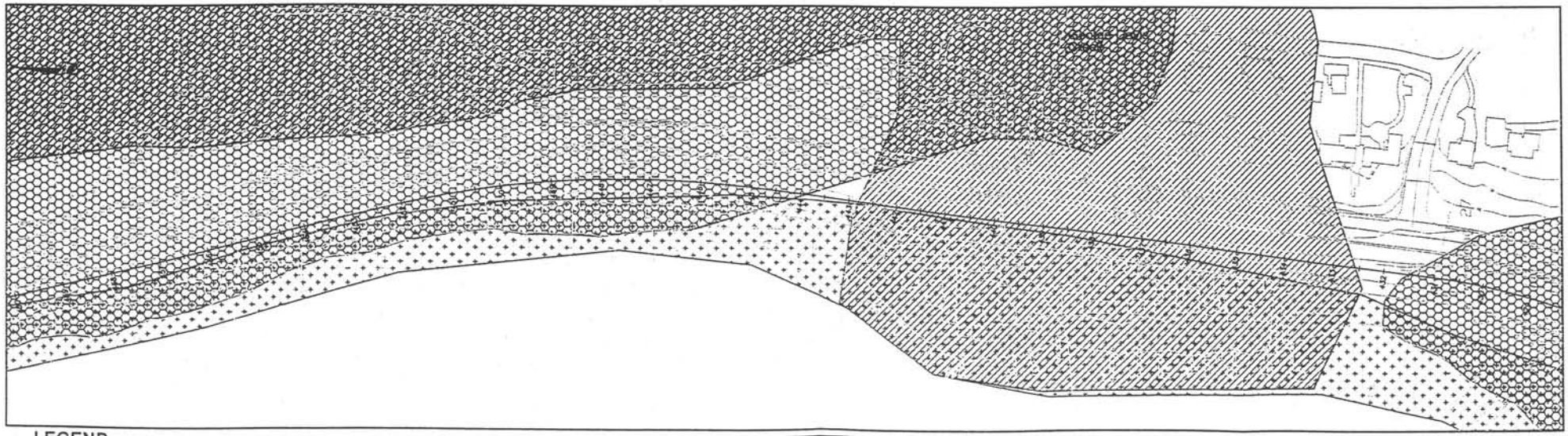
EAST LAKE SAMMAMISH TRAIL
KING COUNTY, WASHINGTON

SITE PLANS WITH
GEOLOGIC HAZARDS

DRAWN BY HAC
CHECKED BY BWT
DATE 1.26.00

FIGURE NO. A - 3
PROJECT NO. 99179





LEGEND

SEISMIC HAZARD AREAS

LANDSLIDE HAZARD AREAS

EROSION HAZARD AREAS

0' 100' 200' 400'

REFERENCE: Base map provided by PARAMETRIX, INC.

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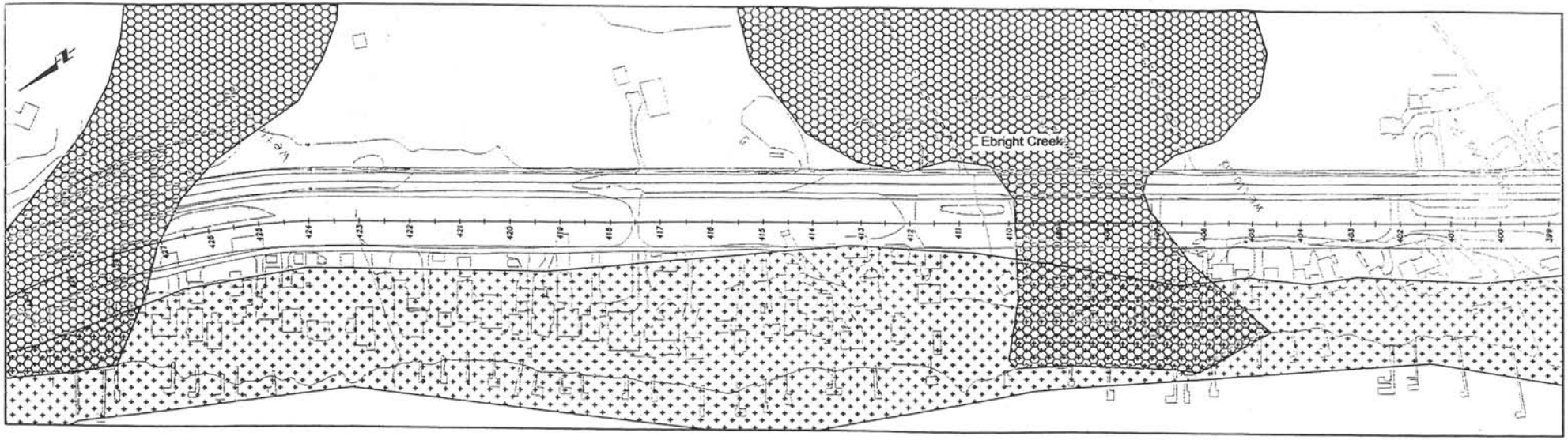
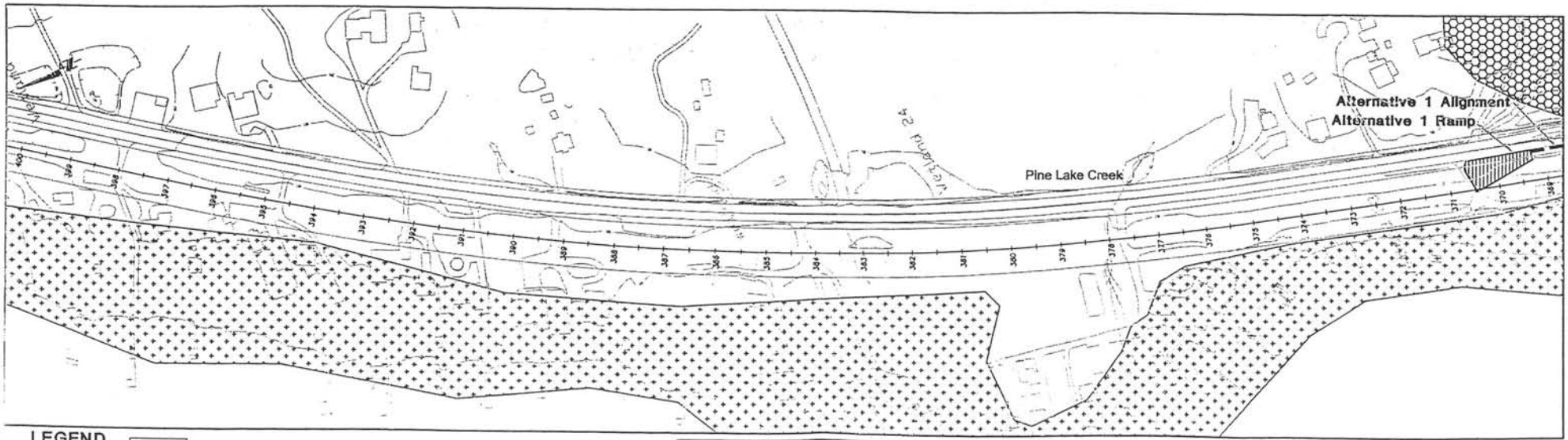
EAST LAKE SAMMAMISH TRAIL
KING COUNTY, WASHINGTON

SITE PLANS WITH
GEOLOGIC HAZARDS

DRAWN BY HAC	FIGURE NO. A-4
CHECKED BY BWT	
DATE 1.26.00	PROJECT NO. 99179





LEGEND

SEISMIC HAZARD AREAS

EROSION HAZARD AREAS

0' 100' 200' 400'

REFERENCE: Base map provided by PARAMETRIX, INC.

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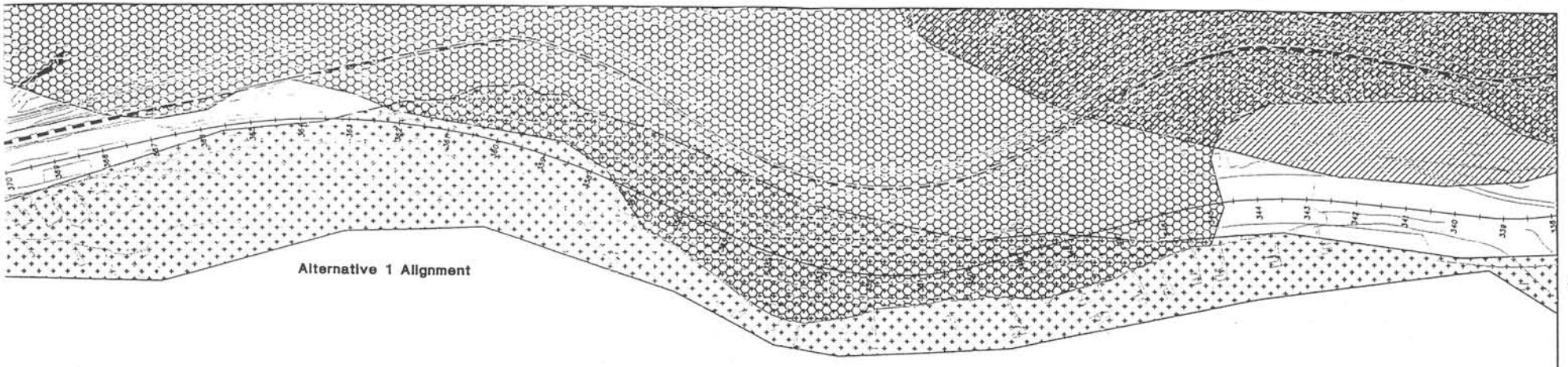
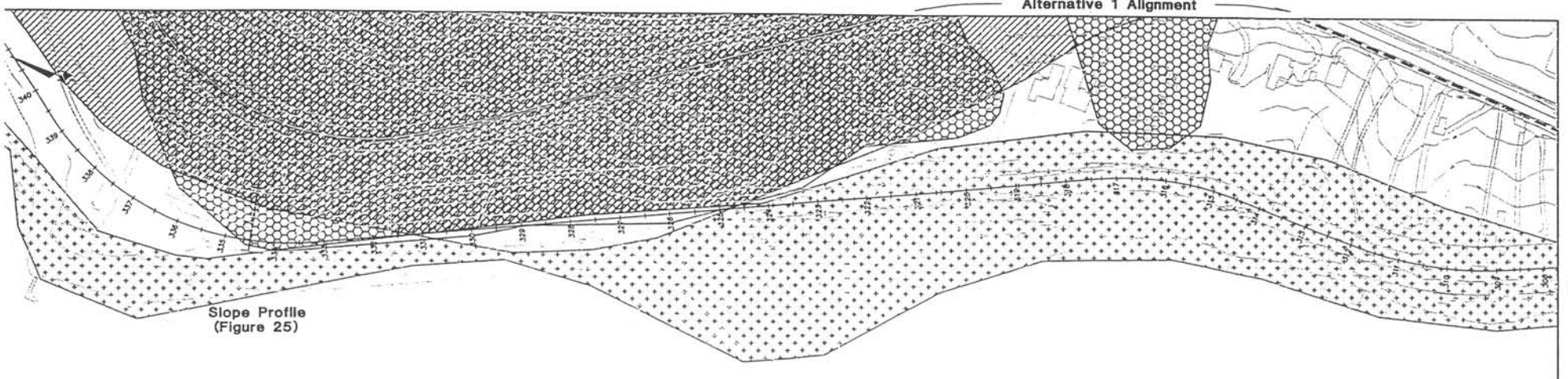
HWA GEOSCIENCES INC

EAST LAKE SAMMAMISH TRAIL
KING COUNTY, WASHINGTON

SITE PLANS WITH GEOLOGIC HAZARDS

DRAWN BY HAC	FIGURE NO. A - 5
CHECKED BY BWT	
DATE 1.26.00	PROJECT NO. 99179





LEGEND

SEISMIC HAZARD AREAS

EROSION HAZARD AREAS

LANDSLIDE HAZARD AREAS

0' 100' 200' 400'

REFERENCE: Base map provided by PARAMETRIX, INC.

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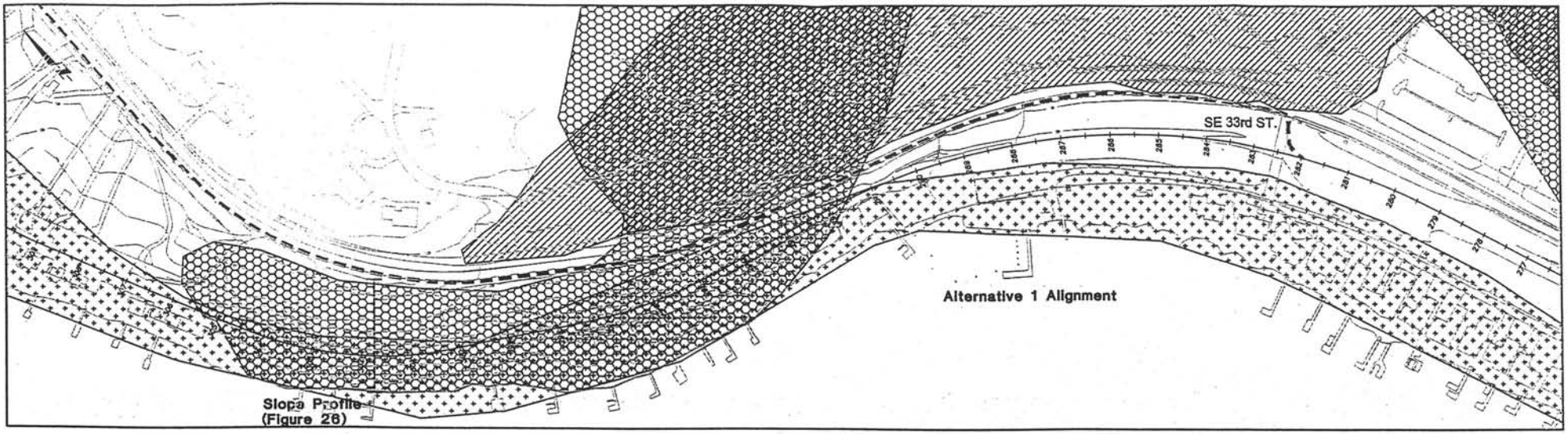
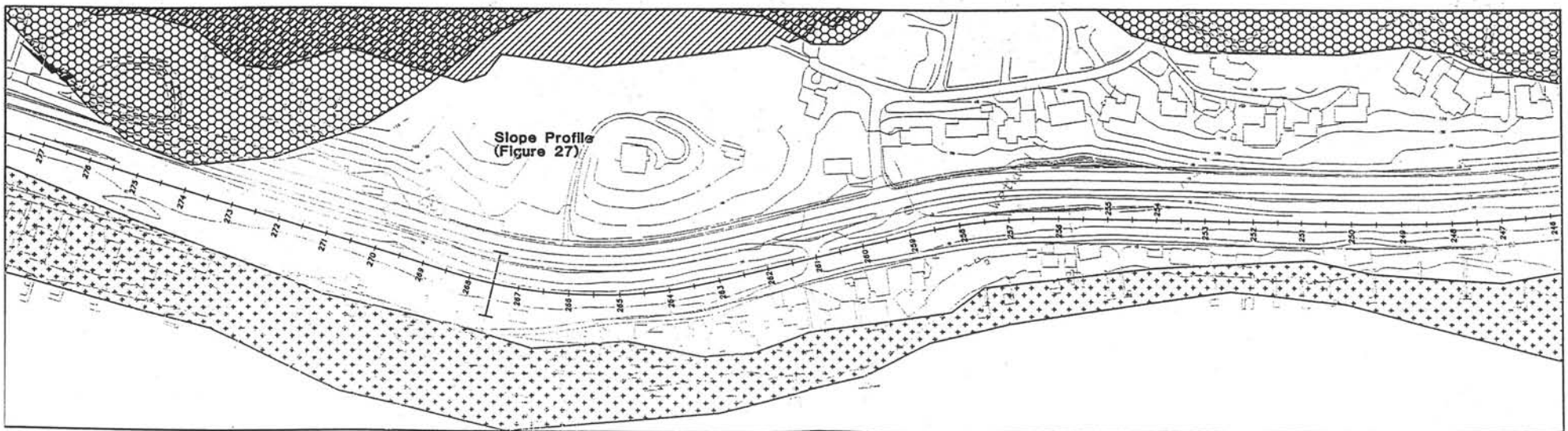
EAST LAKE SAMMAMISH TRAIL
KING COUNTY, WASHINGTON

SITE PLANS WITH
GEOLOGIC HAZARDS

DRAWN BY HAC
CHECKED BY BWT
DATE 1.26.00

FIGURE NO. A-6
PROJECT NO. 99179





LEGEND

SEISMIC HAZARD AREAS

LANDSLIDE HAZARD AREAS

EROSION HAZARD AREAS

0' 100' 200' 400'

REFERENCE: Base map provided by PARAMETRIX, INC.

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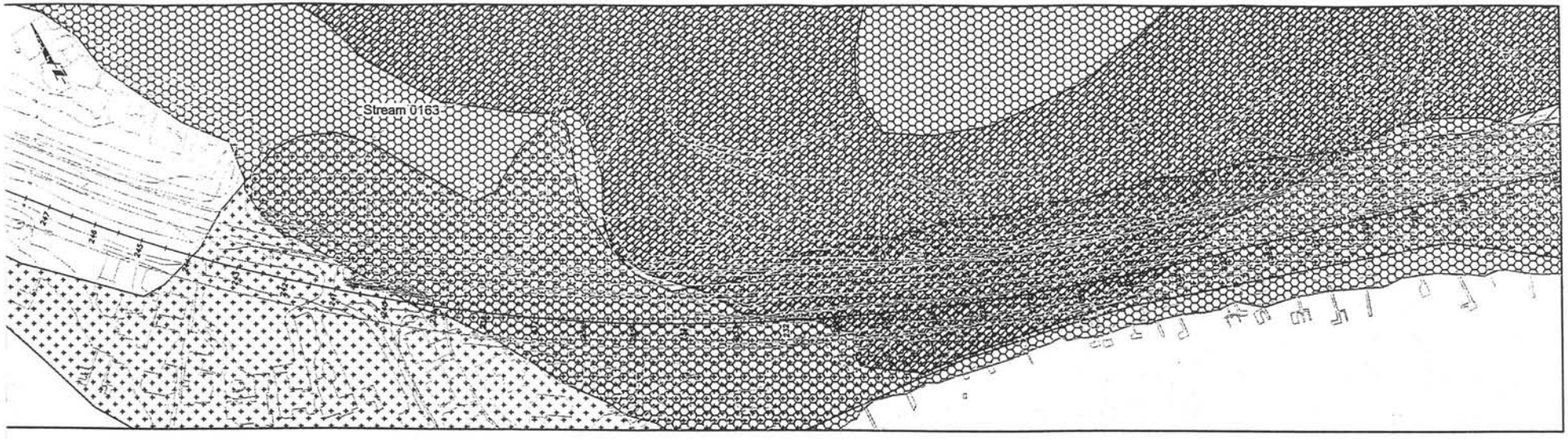
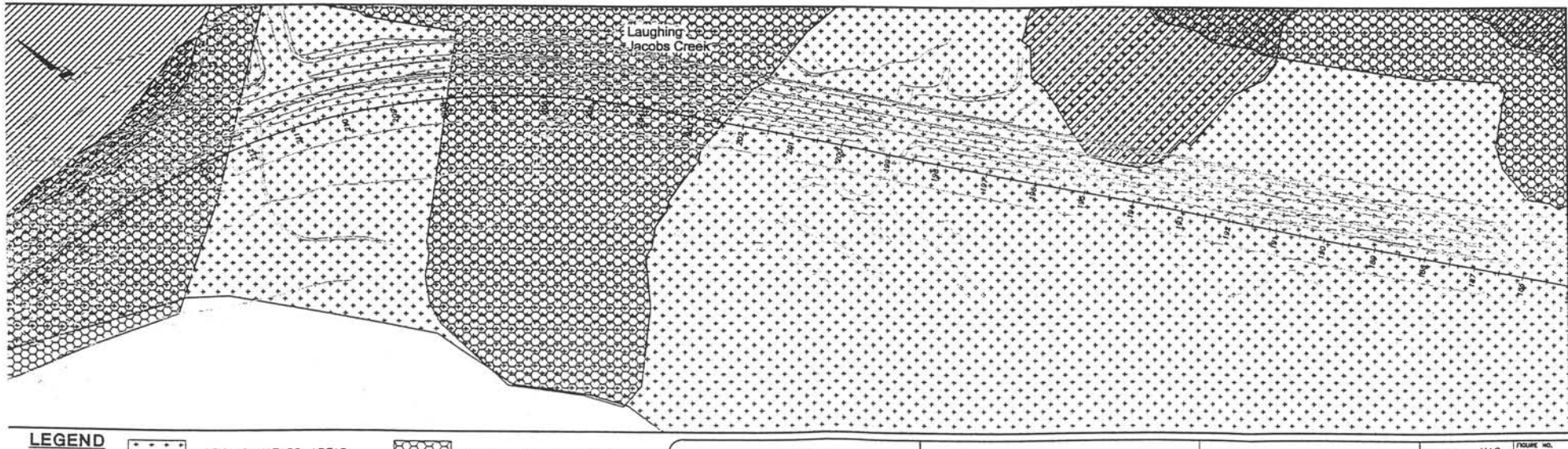
HWA GEOSCIENCES INC.

EAST LAKE SAMMAMISH TRAIL
KING COUNTY, WASHINGTON

SITE PLANS WITH
GEOLOGIC HAZARDS

DRAWN BY HAC	FIGURE NO. A - 7
CHECKED BY BWT	
DATE 1.26.00	PROJECT NO. 99179





LEGEND

SEISMIC HAZARD AREAS

EROSION HAZARD AREAS

LANDSLIDE HAZARD AREAS

0' 100' 200' 400'

REFERENCE: Base map provided by PARAMETRIX, INC.

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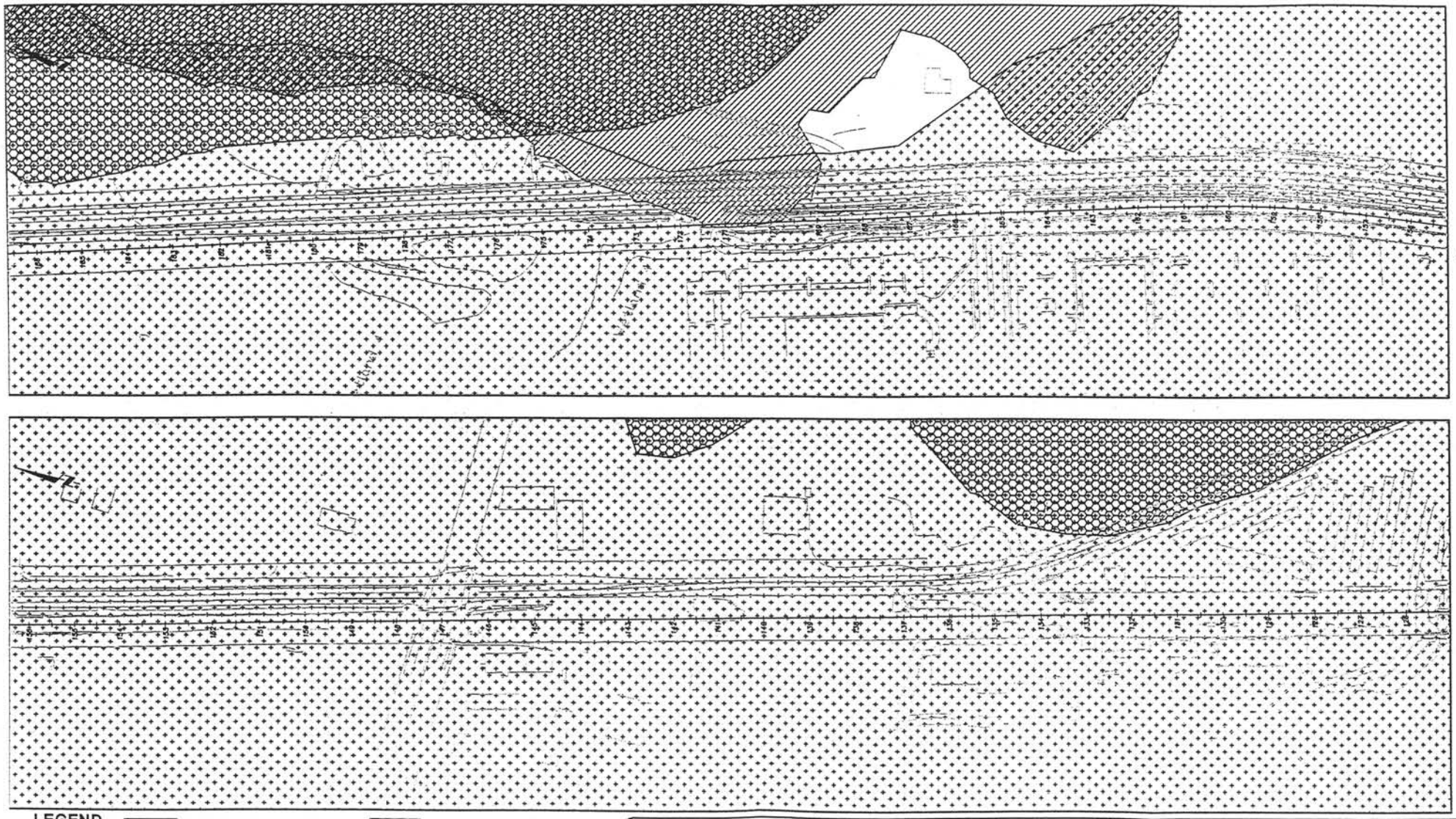
GEO SCIENCES INC.

EAST LAKE SAMMAMISH TRAIL
KING COUNTY, WASHINGTON

SITE PLANS WITH GEOLOGIC HAZARDS

DRAWN BY HAC	FIGURE NO. A - 8
CHECKED BY BWT	
DATE 1.26.00	PROJECT NO. 99179



LEGEND

SEISMIC HAZARD AREAS

LANDSLIDE HAZARD AREAS

EROSION HAZARD AREAS

0' 100' 200' 400'

REFERENCE: Base map provided by PARAMETRIX, INC.

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HWA GEOSCIENCES INC

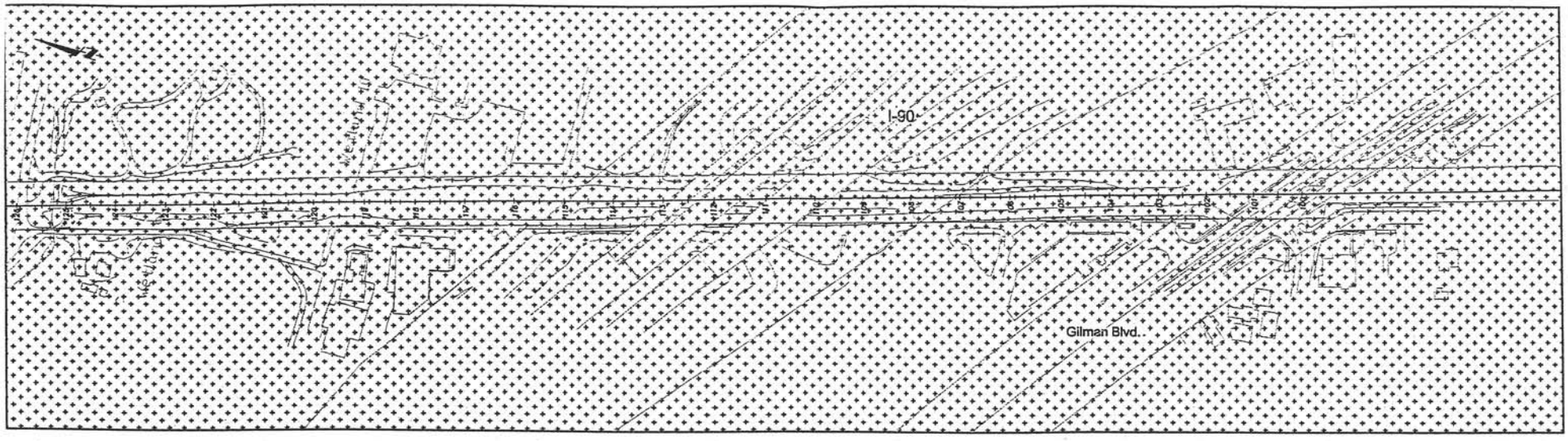
EAST LAKE SAMMAMISH TRAIL
KING COUNTY, WASHINGTON

SITE PLANS WITH
GEOLOGIC HAZARDS

DRAWN BY HAC
CHECKED BY RWT
DATE 1.26.00

FIGURE NO. A-9

PROJECT NO. 99179



LEGEND

SEISMIC HAZARD AREAS

0' 100' 200' 400'

REFERENCE: Base map provided by PARAMETRIX, INC.

C:\1PROJECTS\99\99179\99179023.DWG

HWA GEOSCIENCES INC.

EAST LAKE SAMMAMISH TRAIL
KING COUNTY, WASHINGTON

SITE PLANS WITH
GEOLOGIC HAZARDS

DRAWN BY HAC	FIGURE NO. A - 10
CHECKED BY BWT	
DATE 1.26.00	PROJECT NO. 99179

Hazardous Materials

Leaks or Spills of Hazardous Materials During Railroad Operation

The rail line that formerly occupied the proposed Interim Use Trail corridor was a branch line that provided limited service to the rural area east of the City of Redmond. This branch of the railroad did not serve a highly industrial area; the main industry was a dairy in Issaquah. Therefore, transport of carloads of hazardous materials on this rail line was probably minimal.

The potential did exist for leaks or spills of diesel fuel from locomotive fuel tanks during a derailment. According to the Burlington-Northern Santa Fe (BNSF) Railroad, records regarding hazardous materials leaks or spills from operations on this branch of the railroad exist for the past 10 years. These records do not indicate leaks or spills of hazardous materials associated with operation of this branch of the railroad (Sheppard, personal communication, 2000).

Another potential source of hazardous materials during railroad operation was incidental drips of oils and lubricants from railroad locomotives and cars. This type of incidental leakage occurs on all railroads and is generally proportional to the amount of railroad traffic, similar to the deposition of oils and lubricants on highways. Such leakage is restricted to the railbed and is manifested as discoloration of railroad ties and gravel ballast. The residual petroleum hydrocarbons from this incidental leakage would be subjected to weathering and transport processes, including biodegradation in the ballast and underlying soil, contact with rainwater, and flow to streams and groundwater. Considering the limited volume of the leakage and the propensity for these types of hydrocarbons to break down in the environment, major impacts to streams and groundwater would not be expected.

Application of Chemicals to Control Weeds

Weed control is conducted along railroad corridors to keep tracks and ballast clear of vegetation and to prevent trackside fires. King County will maintain weeds along the corridor by use of weed trimmers and mechanical mowers and does not apply chemicals for weed control.

According to the BNSF Railroad, records regarding application of weed-control chemicals on this branch of the railroad exist for the past 10 years. These records indicate that all weed control was conducted by State-licensed herbicide applicators (Sheppard, personal communication, 2000). Licensed applicators are required to have a thorough knowledge of the chemical properties and recommended application rates of the herbicides they apply.

Wood-Preserving Chemicals in Wood Railroad Ties

Wood railroad ties are chemically treated to prevent insect attack and to maximize tie life. Creosote, a derivative of coal tar, is the oldest and most common chemical preservative used on railroad ties. Pentachlorophenol was introduced in the early 1960s as an effective wood-preserving chemical for use on railroad ties and other wood materials.

Although wood-preservative chemicals in railroad ties present the potential for leaching into surrounding soils, the potential is low due to the low solubility and mobility of these chemicals in water. A study by the Association of American Railroads examined the leaching

characteristics of various types of wood railroad ties from throughout the United States, ranging in ages from new to 50 years. The results of Toxicity Characteristic Leaching Potential (TCLP) testing indicated creosote concentrations less than 5 percent of the Federal regulatory threshold that would classify the ties as hazardous waste (Association of American Railroads, 1994). Similar research by the Electric Power Research Institute (1992) on wood poles and crossarms treated with pentachlorophenol showed mean concentrations of 1/50th of the hazardous waste threshold. Soil testing by the Forest Products Laboratory of Mississippi State University failed to show any traces of creosote more than 5 cm from wood poles that had been treated with creosote prior to being driven into the earth (United Kingdom Creosote Council, 2000).

Most of the railroad ties were removed from the railbed during the rail salvage project. In eight segments of the railbed (total of approximately 2,500 linear feet), ties were left in place due to wet conditions and the presence of adjacent sensitive environments (Parametrix, 1999). Splinters from railroad ties generated during railroad tie removal activities may be present within the project corridor.

Incidental Leaks of Oils, Lubricants, and Fuels from Construction Equipment During the Rail Salvage Project

Pollution prevention measures were in place as of March 30, 1999 as part of the rail salvage project conducted within the corridor and on the railbed (King County, 1999a). These measures included application of Best Management Practices (BMPs) for prevention, identification, reporting, and cleanup of any fluid leaks and spills from vehicle equipment use and storage. No incidents of leaks or spills of oils, lubricants, or fuels occurred during the period that the pollution prevention measures were in effect (Parametrix, 1999).

Preliminary Soil Sampling Results from Sites of Interest

During the course of identifying and disposing of non-salvageable railroad ties left during the rail salvage project, King County staff observed two sites on the trail alignment for collection of soil samples. One site (a segment approximately 300 feet long, just south of the intersection of the trail and SE 33rd Street) was temporarily used to store damaged non-salvageable railroad ties. The other site (a location approximately 50 feet south of the North Fork Issaquah Creek bridge on the trail alignment, near SE 62nd Street) exhibited soil discoloration adjacent to the drainage ditch on the east side of the alignment.

Two soil samples were collected from the former site and three soil samples were collected from the latter site. All of the samples were subjected to screening test to determine the presence or absence of total petroleum hydrocarbons (TPH). The two samples from the SE 33rd Street site indicated the presence of diesel and heavy oil, and two of the three samples collected at the SE 62nd Street site indicated the presence of heavy oil only. These screening tests do not quantify the concentrations of TPH or allow comparison to Department of Ecology soil cleanup standards; therefore, King County is in the process of developing an investigation plan to collect additional soil samples for testing of specific TPH parameters.

APPENDIX B
SURFACE WATER

SURFACE WATER

AFFECTED ENVIRONMENT

Bear Creek Basin. Bear Creek Basin, located north of Lake Sammamish, covers approximately 51 square miles and drains into the Sammamish River in Redmond. The upper portions of the watershed are relatively undeveloped. The Interim Use Trail would be located in the Lower Bear Creek sub-basin where land use is predominately urban residential and commercial (King County, 1990a).

The corridor lies within the Bear Creek Basin, however it does not cross the creek or the designated Federal Emergency Management Agency (FEMA) floodplain.

King County has designated the lower reaches of Bear Creek as a Regionally Significant Resource Area because of its excellent habitat and water quality; it is also one of the most productive salmon spawning streams in the Puget Sound Basin. Although Bear Creek has excellent water quality, it has exceeded criteria for fecal coliform and mercury in the lower reaches, and the Washington State Department of Ecology (Ecology, 1998) placed it on the 1998 303(d) list of threatened and impaired water bodies. The 100-year floodplain of Bear Creek is mapped in the vicinity of the project area (FEMA, 1998). No local drainage or flooding problems have been reported in this area.

Sammamish River Basin. The Sammamish River Basin drains a total of 150 square miles. However, all but 26 square miles of this area drains through Lake Sammamish or Bear Creek, (King County, 1993b). The Sammamish River flows north, connecting Lake Sammamish with Lake Washington. The Sammamish River is approximately 13 miles long and relatively linear with a uniform channel configuration along much of its length. Land use adjacent to the river is a combination of urban, residential, and agricultural uses. A portion of Segment 2 of the Interim Use Trail would be located within an area draining to the Sammamish River. However, this area is located approximately one mile from the river, near its source (Lake Sammamish), and no concentrated flow from the trail reaches the river.

Ecology has listed the Sammamish River on the 1998 303(d) list for exceeding temperature, fecal coliform, and pH criteria. FEMA has designated an extensive 100-year floodplain for the Sammamish River north of the project area.

East Lake Sammamish Basin. The 16-square mile East Lake Sammamish Basin is composed of six major sub-basins (from north to south) Panhandle, Inglewood, Monohon, Thompson, Pine Lake, and Laughing Jacobs (Figure 3.2-2 in Chapter 3). These are drained by 14 Class AA perennial creeks, 8 intermittent creeks, and 37 additional drainage routes as designated by the Washington State Department of Ecology (see Geology Appendix, King County, FEIS, 2000a, and King County, 1999b).

The streams, which generally originate in wetlands located on the Sammamish Plateau, drain west through steep ravines to Lake Sammamish. Numerous seeps also emerge along the base of

the Plateau and supply additional surface water for streams and wetlands. Rapid and intense development has degraded the hydrology and water quality in Lake Sammamish and the numerous creeks that drain into the lake (King County, 1990b).

The proposed project site is located along the toe slope of the Sammamish Plateau and typically runs perpendicular to natural drainage routes. Local flooding and drainage problems common within the project area have been attributed to: (1) historic alteration of natural drainage patterns by construction and operation of the railroad and East Lake Sammamish Parkway, (2) residential development, (3) natural seeps and springs, and (4) poorly maintained local drainage systems. Flooding complaints documented by the King County Water and Land Resources Division, Drainage Services Section, are summarized in the Surface Water Appendix (King County, FEIS, 2000a). Based on detailed descriptions of the above complaints, only two complaints are directly related to the railroad. Both are these complaints are related to maintenance of existing (historic) drainage patterns.

The main sub-basins and surface water features in the East Lake Sammamish Basin are discussed in detail in the following sections.

Lake Sammamish. Lake Sammamish, with a surface area of approximately 4,900 acres, is one of the largest lakes in the Puget Sound Basin (King County, 1999c). The Lake receives flow primarily from Issaquah Creek and discharges north through the Sammamish River to Lake Washington, Lake Union, and Puget Sound. Most of the watershed is located within the King County Urban Growth Boundary (UGB) and is (or is proposed to be) developed with high-density residential and commercial land uses (King County, 1994b). Section 3.6, Land and Shoreline Use, describes projected land use for this watershed. Within the project area residential development has been concentrated between the East Lake Sammamish Parkway and the lake shore.

Lake Sammamish is listed as a King County Sensitive Lake because water quality studies conducted over the last 30 years have demonstrated that the lake is sensitive to phosphorus loading (King County, 1990b, 1995a). In 1968, Metro completed a water quality improvement project that ended direct discharges of sewer effluent to Lake Sammamish (King County, 1999c). To further protect the lake, King County has adopted strict water quality and stormwater standards that regulate basin development to protect the lake from excessive phosphorus loads and to reduce problems with low dissolved oxygen (DO) (King County, 1998a). Ecology included Lake Sammamish on the 1998 303(d) list of threatened and impaired water bodies because fecal coliform criteria were exceeded.

FEMA has mapped a 100-year floodplain, designated Zone X, along the eastern edge of the lake. All of the existing railbed is located outside the floodplain. However, portions of the corridor are located within the floodplain (FEMA, 1995).

Panhandle Sub-basin. The Panhandle sub-basin, located in the northern portion of the East Lake Sammamish Basin, is approximately three miles long and relatively narrow. The sub-basin is drained by seven perennial streams, six intermittent streams (Table B-1), and numerous seeps, which are characteristically short, high-gradient channels (King County, 1994b). Residential development is concentrated along the shores of Lake Sammamish and in portions of

the upper watershed (King County, 1994b). High-density residential development is predicted to increase in the upper portions of the watershed (ECONorthwest, 1998).

King County field surveys noted no significant water quality problems for parameters other than total suspended sediment in any of the Panhandle Sub-basin drainages. However, all of these drainages have problems with incision in steep stream reaches and sedimentation in the lower reaches (King County, 1994b).

FEMA floodplains are not mapped for any of the streams in this sub-basin. However, numerous drainage and local flooding problems within the project area have been reported due to seeps and poor conveyance systems. Generally, development along the trail in this sub-basin is sparse. Nevertheless, local drainage and flooding problems have been reported in this area due to blocked pipes and ditches and altered flow regimes (King County, 1994b). Capital improvement projects to replace culverts under the railbed have been identified for several streams.

Table B-1. Streams in the Panhandle Sub-basin, East Lake Sammamish Basin.

Stream ID	Trail Station	Classification[1]	Channel Description[2]
0143A	597.6	**Perennial Class 2, unknown salmonid use**	Upstream substrate consists of cobble and riprap. The creek is piped to Lake Sammamish downstream of the railbed.
0143B	551.5	Intermittent	Upstream substrate consists of sand and silt, and the channel lies in a ditch. Downstream the creek is piped to Lake Sammamish.
0143C		Intermittent	**Flows into Stream 0143B upstream of the railbed.**
0143D	537.6	Intermittent	(Not located)
0143E	532.5	Intermittent	Upstream substrate consists of sand and silt, and the channel is straight. Downstream the creek is on private property (not investigated).
0143F	527.0	Perennial Class 2, no salmonids	Substrate consists of silt and organic debris, and the channel is straight. Downcutting due to erosion at the downstream end of culvert has occurred.
0143G	524.2	Perennial Class 2, no salmonids	Substrate consists of a combination of gravel, and sand/silt. Sandbags have been used downstream to dam the creek to divert flow to a fish incubator.
0143M	509.0	Perennial Class 2, no salmonids	Substrate consists of a combination of gravel, and sand/silt. Upstream slope to East Lake Sammamish Parkway is steep. Approximately 15 feet of downcutting has occurred, and it appears that the bank has poor stability. Less erosion has occurred downstream and channel meanders are present.
0143H	502.2	Perennial Class 2, no salmonids	Substrate consists of cobble and gravel. Some downcutting due to erosion has occurred at the downstream end of a culvert.
0143I	488.5	Intermittent	Upstream substrate consists mostly of sand/silt with some gravel. Upstream slope to East Lake Sammamish Parkway is steep. Downstream the creek is piped to Lake Sammamish.
0143J	484.4	Intermittent	Substrate consists mostly of sand/silt with some gravel. The creek is in a ditch upstream of the crossing. Downstream, the creek appears to have poor bank stability.
0143K	472.0	Perennial Class 2, no salmonids	Substrate consists of silt/sand. Channel is straight. No flow in creek during site visit (despite being classified as perennial).
0143L	462.6	Perennial Class 2, no salmonids	Substrate consists of a combination of sand/silt and gravel. Upstream there is a 10-ft drop from East Lake Sammamish Parkway, and siltation problems, and the creek flows through a wetland. Downstream the channel is straight.

Notes: [1] Classification and salmonid use based on King County Investigations (1994b).

[2] Channel descriptions based on Parametrix, Inc. field investigations conducted in Fall 1999.

Inglewood Sub-basin. The Inglewood sub-basin covers approximately 1,559 acres and drains through George Davis Creek (known locally as Inglewood or Eden Creek). George Davis Creek originates on the Sammamish Plateau in a network of wetlands and springs. Land use in this sub-basin is changing from forested to residential uses (King County 1994b, 1998a, ECONorthwest, 1998).

George Davis Creek is a Class 2 stream that supports salmonids. Water quality monitoring in this creek indicates problems with *Enterococcus* bacteria and nitrogen possibly due to septic tanks (in a neighborhood serviced by septic systems west of 228th that is frequently flooded) or sewer system leaks. Sediment deposition, which is common within the project area, may also degrade water quality and habitat (King County, 1994b).

FEMA has not mapped a floodplain associated with this creek. Two concrete pipes (36-inch and 24-inch diameters) currently convey the creek under the existing railbed. Although these pipes have capacity to convey existing flows, King County has recommended a capital improvement project (CIP), which would replace them with a single 72-inch diameter pipe (King County, 1994b). The creek enters another pipe downstream of the railbed and flows under a house before reaching the lake. George Davis Creek was reported to flood adjacent properties during storm events in 1991, 1994, and 1996 (King County, 1999d). Local flooding along the railroad track is also common (King County, 1994b).

Monohon Sub-basin. The Monohon sub-basin is divided into the north, middle, and south drainages along the eastern edge of Lake Sammamish. The main features of each Monohon sub-basin drainage are summarized in Table B-2. Much of this basin drains directly to Lake Sammamish without forming a distinct channel. Land use within the basin is currently a combination of forest and dense residential. Future development is expected to be predominately dense residential (King County, 1994b).

Table B-2. Streams in the Monohon Sub-basin, East Lake Sammamish Basin.

Stream ID	Sub-basin	Classification[1]	Channel Description[2]
Zaccuse Creek	North Monohon	**Perennial Class 2, salmonids**	Substrate consists of cobble and sand/gravel. Upstream the channel is vegetated with blackberry bushes and is part of Wetland 26. Downstream the channel contains riffles and flows into a pipe under a house.
0155	Middle Monohon	Intermittent	Could not be located.
0162A	South Monohon	Intermittent	Substrate consists of sand/silt. Upstream the channel is in a wet ditch, which is steep and eroded between East Lake Sammamish Parkway and the railroad. Downstream the channel disappears into private lawn.
0163	South Monohon	Perennial Class 2, salmonids	Substrate upstream consists of silt/sand and it appears to have poor bank stability. Downstream substrate consists of gravel/cobble. Channel discharges to the lake.
Many Springs Creek	South Monohon	Perennial Class 2, salmonids	Substrate consists of silt/sand. Upstream the channel is located in a wet ditch. Downstream the channel flows through Wetland 3.

Notes: [1] Classification based on King County Investigations (1994b)
[2] Channel descriptions based on Parametrix, Inc. field investigations conducted in Fall 1999.

The northern drainage area in the Monohon sub-basin is located between the Inglewood and Thompson sub-basins. Zaccuse Creek is the primary drainage feature in this basin. Zaccuse Creek originates in a series of wetlands and flows northwest to Lake Sammamish. It is a Class 2

stream with salmonids. Channel incision has been reported in the middle reaches of Zaccuse Creek and sedimentation has occurred in the downstream reaches, which degrades water quality. No other water quality problems have been reported in the sub-basin (King County 1994b). FEMA has not mapped a floodplain along this creek. Zaccuse Creek is conveyed under the existing railbed in a 36-inch concrete pipe; no flooding problems have been reported although flooding is expected under existing land use conditions assuming a 25-year or greater return frequency storm event discharge rate (King County, 1994b).

The middle drainage area, located between the Pine Lake and Thompson sub-basins, is drained by Stream No. 0155 (See Figure 3.2-2, Chapter 3), a Class 2 intermittent stream. The stream is conveyed under the railbed in a 12-inch corrugated metal pipe (CMP). No evidence of flooding problems was observed during a winter 1999 field investigation.

The southern drainage area contains three notable streams: Many Springs Creek and Stream No. 0163, which are both Class 2 streams with salmonids, and Stream No. 0162A, which is an intermittent stream. Many Springs Creek has experienced both channel incision and downstream sedimentation. Although Ecology has not included it on the 303(d) list, water quality has been impaired by fine sediment deposition. Many Springs Creek is conveyed under the existing railbed through a 24-inch CMP. Modeled flow data predict flooding under existing development conditions during a 25-year or greater return frequency storm event (King County, 1994b). Stream Nos. 0163 and 0162A have no reported water quality problems (King County, 1994b). Stream No. 0163 is conveyed under the existing railbed in a 24-inch clay pipe; no evidence of flooding or capacity problems was observed during a field investigation (Parametrix, 1999). Stream No. 0162A is conveyed in a 24-inch concrete pipe, which has been reported to be undersized (King County, 1999b).

Thompson Sub-basin. The Thompson sub-basin covers approximately 1,176 acres in the middle of the East Lake Sammamish Basin. Current land use in this sub-basin is a combination of rural and urban residential uses and undeveloped land. However, land use is projected to become predominately urban residential, except for a small area located in the stream ravine that would remain rural (King County, 1994b). Ebright Creek, a Class 2 salmon-bearing creek (see Figure 3.2-2, Chapter 3), is the most notable drainage feature in this sub-basin. It is fed by two tributaries that originate on the Sammamish Plateau in Wetlands 14, 17, 61, and 62. In the project area, large woody debris and boulders have been placed in the channel to reduce erosion and enhance instream habitat. King County (1994b) has documented erosion problems in the upper watershed and sedimentation problems in the lower watershed. Water quality monitoring also indicates that fecal coliform, total phosphorus, and turbidity concentrations have been high during storm events.

FEMA has not mapped a floodplain in the project area. However, a hydraulic study indicates that the existing railbed lies outside the flood elevation during a 100-year flood event (King County, 1999b). A 36-inch concrete pipe and a 36-inch CMP convey the creek under the existing railbed. Although these culverts have enough capacity to convey the 100-year flood event, a King County CIP has been identified to replace these culverts with a bridge to improve fish passage (King County, 1994b).

Pine Lake Sub-basin. The Pine Lake sub-basin covers approximately 773 acres in the middle of the East Lake Sammamish Basin. Pine Lake Creek originates on the Sammamish Plateau in Pine Lake and Wetland 24 (see Figure 3.2-2, Chapter 3). The creek then drains west to Lake Sammamish through a steep ravine composed of glacial till soils underlain with highly erodible sandy outwash soils. The main tributary, Kanim Creek, joins Pine Lake Creek upstream of the project area. Downstream of the existing railbed, boulders and large woody debris have been added to the stream to enhance habitat. Current land use in this basin is a combination of forested, and rural and urban residential use; however, future land use will be primarily urban residential (King County, 1994b). Pine Lake Creek is a Class 2 perennial salmon-bearing creek. Ecology listed the creek on the 1996 and 1998 303(d) lists for fecal coliform and recommends establishment of a total maximum daily load (TMDL) for the sub-basin. Although FEMA has not mapped a 100-year floodplain, hydraulic studies indicate that the existing railbed is outside the local floodplain (King County, 1999b). Two 36-inch concrete pipes convey Pine Lake Creek under the existing railbed. Although these pipes can convey the 100-year storm event, a King County CIP recommends that they be replaced with a bridge (King County, 1994b). This capital improvement project has not yet been completed.

Laughing Jacobs Sub-basin. The Laughing Jacobs sub-basin includes approximately 3,600 acres of the southern portion of the East Lake Sammamish Basin. The basin is drained by Laughing Jacobs Creek, which begins in Wetland 26 (also known as Laughing Jacobs Lake), flows through a steep ravine, and discharges to Lake Sammamish near the state park. Although land use in 1989 was approximately 63 percent forested with scattered residential development, the sub-basin has been rapidly developed and is expected to reach approximately 89 percent urban development (see Section 3) (King County, 1994b). King County has rated this creek as a Class 2 stream that supports salmonid populations. Ecology listed the creek on the 303(d) list in 1996 and 1998 for exceeding fecal coliform criteria. The creek has high phosphorus content from agricultural land uses and sediment loads which originate from active landslides in the lower reaches of the creek (the upper portions are underlain by bedrock) (King County, 1990b).

FEMA has not designated a 100-year floodplain associated with Laughing Jacobs Creek. However, hydraulic modeling of the creek has been used to map a local floodplain within the project area (King County, 1999b). Results from this study indicate that the existing railbed is located above the flood stages predicted for a 100-year storm event. The existing railbed crosses the creek on a bridge, which has enough capacity to convey the 100-year flood event.

Issaquah Creek Basin. The Issaquah Creek Basin covers approximately 61 square miles in the southern portion of the Lake Sammamish Basin. The North Fork sub-basin, containing the proposed trail covers approximately 2,855 acres. Flow in this sub-basin originates on the Sammamish Plateau at Yellow Lake, and enters the main fork of Issaquah Creek just upstream of Lake Sammamish. The North Fork of Issaquah Creek is low gradient in the upper and lower reaches but flows through a steep ravine near the middle of the watershed. The sub-basin is nearly 75 percent forested (King County, 1994c) with portions of the basin developed with high-density residential uses. Development within the basin is projected to increase. Water quality in the North Fork has been impacted by runoff from impervious surfaces located in the city of Issaquah and from discharges from a storm sewer outfall at River Mile (RM) 0.2 (King County, 1994c).

Flooding is concentrated in the lower reaches of the sub-basin where FEMA has mapped a 100-year floodplain (FEMA, 1995). The existing railbed is elevated above the 100-year flood elevation on fill.

Existing Regulatory Environment

Federal, state, and local regulations govern stormwater quantity, water quality, and floodplains in each of the affected watersheds. The federal government regulates floodplains and water quality through permits issued by the state. At a minimum, state and local agencies must meet federal requirements. However, within the project area, state and local government agencies have adopted stricter standards. Ecology has established water quality standards for the state and has recommended that total daily maximum loads (TMDLs) be established for Bear Creek, Issaquah Creek, Pine Lake Creek, and Lake Sammamish.

FEMA has mapped 100-year floodplains on Flood Insurance Rate Maps (FIRM), which regulate development within these watersheds. The Clean Water Act is the federal law that regulates direct discharge of pollutants to water resources through the use of permits.

King County and the cities of Redmond and Issaquah have developed Sensitive Areas Ordinances (SAO) to address water quality treatment within the project site. Lake Sammamish has been designated as a Sensitive Lake; therefore, specific treatment standards may apply to the project. The *King County Surface Water Design Manual* (1998b) has been adopted by the cities of Issaquah and Sammamish and would apply to most of the project site. The City of Redmond has adopted Ecology's *Stormwater Management Manual for Puget Sound Lowlands* (Ecology, 1992). King County and the cities have adopted basin plans—for Lake Sammamish, Issaquah Creek and Bear Creek—that outline basin-specific requirements designed to protect sensitive portions of these watersheds.

APPENDIX C
PLANTS AND WETLANDS

PLANTS AND WETLANDS

AFFECTED ENVIRONMENT

Wetlands

This section describes the wetlands that occur in the project corridor. Wetlands are defined as those areas that are inundated or saturated for long enough during the growing season to develop anaerobic conditions in the upper portion of the soil, which results in the development of wetland vegetation and hydric soils. Parametrix, Inc. staff identified wetlands in April of 1999, and delineated vegetated wetlands during November and December 1999, and January and February 2000. Wetland delineation methods were based on the *Wetland Delineation Manual* (Environmental Laboratory, 1987) and the *Washington State Wetlands Identification and Delineation Manual* (Ecology, 1997).

Wetlands were classified according to the U.S. Fish and Wildlife Service *Classification of Wetlands and Deep Water Habitats of the United States* (Cowardin et al., 1979). Boundaries of palustrine (vegetated) wetlands occurring in the project area were delineated within the corridor, or within 25 feet of the top edge of the railbed. Lacustrine wetlands occur along the Lake Sammamish shoreline adjacent to the corridor in several locations. Boundaries of lacustrine wetlands were not delineated and are assumed to occur at the shoreline waterwards until water depths are greater than 6.6 feet. Additional detailed information is located in the Wetland Appendix, *East Lake Sammamish Trail Wetlands Report* (King County, FEIS, 2000a). Wetland functional assessments were made for vegetated wetlands based on the presence of indicators and professional judgment. These assessments focused on hydrological and biological functions typically performed by wetlands (Brinson, 1993; Reimold, 1994; Reppert, et al., 1979).

Wetland Regulatory Environment

Laws regulating wetlands include the Federal Clean Water Act (Sections 404 and 401), under which the U.S. Army Corps of Engineers (ACOE) regulates wetlands as a subclass of Waters of the State. The Washington State Shorelines Management Act, along with local shoreline master programs in each jurisdiction, regulate the shoreline of Lake Sammamish and several streams in the vicinity with mean annual flow of over 20 cubic feet per second (cfs). The Sensitive Areas Regulations of King County and of the cities of Redmond, Sammamish, and Issaquah provide the local regulatory framework. Details of regulatory elements for each jurisdiction are summarized in Table C-1.

Wetlands along the corridor were rated according to state and local regulations. Summaries of the rating definitions are provided in the Wetlands Technical Report Appendix F (King County, FEIS, 2000a). Buffer widths were assigned based on wetland r atings according to the local jurisdiction. In general, wetland buffers in the project vicinity are not vegetated; they are either paved streets or driveways, or are dominated by maintained vegetation such as mowed turf.

Lake Sammamish

Lake Sammamish is mapped by the National Wetlands Inventory ([NWI] FWS, 1989a and 1989b) as lacustrine wetland and deepwater habitat with both limnetic and littoral subsystems. Limnetic habitats are the portions of freshwater lakes where the water is greater than 6.6 feet. Littoral, or nearshore, habitats have water depths less than 6.6 feet. By definition, where littoral wetlands occur, they extend lakeward from the lakeshore to a depth of 6.6 feet and lack persistent emergent vegetation. The majority of the lake is mapped as limnetic with an unconsolidated (un-vegetated) bottom. The NWI maps the occurrence of littoral wetlands along the shore of Marymoor Park and Lake Sammamish State Park and along the southern lakeshore of Weber Point. The corridor lies directly adjacent to the mapped littoral habitat for an approximate 150-foot-long section south of Marymoor Park.

Wetlands of Marymoor County Park and Lake Sammamish State Park

The corridor crosses large wetlands in Marymoor County Park and Lake Sammamish State Park (See Wetland Appendix of King County, FEIS, 2000a, for further discussion). The two wetland areas are each rated by King County and Issaquah as Class 1 wetlands and require 100-foot buffers.

The Marymoor Park wetlands cover approximately 100 acres and are mapped by King County as *Sammamish River #4* (King County, 1991). The wetlands encompass the entire northern end of Lake Sammamish including the east and west sides of the head of the Sammamish River channel. Lacustrine wetlands occur waterward from the lakeshore. Palustrine forested, scrub-shrub, and emergent wetland communities comprise vegetated wetlands north and east of the lake.

Table C-1. Wetland Regulations for Jurisdiction Crossed by the East Lake Sammamish Trail Right-Of-Way

	King County and City of Sammamish[a]	City of Issaquah	City of Redmond	Ecology	U.S. Army Corps of Engineers
Permitting and Regulatory Mechanism	King County Code 21A.24 Sensitive Areas Ordinance	Issaquah Municipal Code 18.10, Environmental Protection and Critical Areas Regulations	Redmond Community Development Guide 20D.140, Sensitive Areas.	Executive Order 89-10: Protection of Wetlands.	Clean Water Act, Section 404.
Wetland Classification System	Defines three wetland classes	Defines three wetland classes	Defines four wetland types	Four wetland categories (defined in Ecology, 1993)	Does not classify wetlands
Buffer Requirements	Class 1 = 100 ft Class 2 = 50 ft Class 3 = 25 ft	Class 1 = 100 ft Class 2 = 50 ft Class 3 = 25 ft	Type I = 100 to 150 ft Type II = 50 to 100 ft Type III = 25 to 50 ft Type IV = 0	General Recommendations Category I = 200 to 300 ft Category II = 100 to 200 ft Category III = 50 to 100 ft Category IV = 25 to 50 ft	Does not regulate buffers
Buffer Modification	Buffers can be averaged or modified subject to conditions and approvals.	Buffers can be averaged or modified subject to conditions and approvals.	Buffers can be averaged or modified subject to conditions and approvals.	Not addressed	Not applicable
Wetland Mitigation Ratios	Creation, Enhancement or Restoration[b] In the same sub-basin or on-site Class 1 and 2 = 2:1 Class 3 = 1:1	Creation, Enhancement or Restoration Class 1 and 2 = 2:1 Class 3 = 1:1	Creation Type I = 6:1, Type II and III = 2:1 Type IV = not required Enhancement Type I = 2:1 Type II and III = 1:1 Type IV = not required	General Recommendations Category III Forested = 3:1 Scrub-shrub = 2:1 Emergent = 2:1 Category IV = 1.25:1	Mitigation is determined on a case-by-case basis.

Note: [a] Through an interlocal agreement, the City of Sammamish follows King County regulations and procedure.
[b] Proposed revisions to King County's Sensitive Areas Ordinance would increase these ratios.

The corridor passes through the eastern portion of this wetland where mature palustrine forested wetland occurs. Black cottonwood (*Populus balsamifera*) and Oregon ash (*Fraxinus latifolia*) form the overstory and mixed shrubs with reed canarygrass (*Phalaris arundinacea*) grow in the understory. In this location, wetland hydrology results from seasonally high groundwater and from stormwater runoff, including a large stormwater outfall.

A second large wetland system is located in Lake Sammamish State Park along the southern shore of the lake. The wetland covers approximately 200 acres and was mapped by King County as *Issaquah Creek #2 (*King County, 1991*)*. The wetland is comprised of forested, scrub-shrub, and emergent palustrine wetlands with lacustrine wetlands occurring north and west of the lakeshore.

In the corridor, the wetland is dominated by reed canarygrass. Growing along the margins of the Parkway and the railbed are mixed patches of willow (*Salix* sp.), young Oregon ash, and black cottonwood trees.

Issaquah Creek, an important regional fish-bearing stream, is located approximately 3,000 feet west of the corridor and flows north through the wetland to the lake. Wetland hydrology results from seasonally high ground water, surface water runoff, and periodic flooding of Issaquah Creek. Three additional small streams flow either through or across the corridor and to the lake.

Both Marymoor Park and Lake Sammamish State Park wetlands are high functioning ecosystems providing biological support and wildlife habitat, including habitat for threatened and endangered species, and species of special concern (see Wildlife and Fish Section 3.4 for more detail on habitats in these areas). Hydrologic functions provided by these wetlands include water quality improvement through sedimentation and nutrient transformation, stormwater detention, and floodwater attenuation. These functions help maintain water quality and aquatic habitat in adjacent Lake Sammamish.

Wetlands Associated with Salmonid-Bearing Streams

There are eight streams in the project area that are known to have salmonid fish species (see Wildlife and Fish, Section 3.4), and seven of these streams are associated with wetlands in the corridor (see Wetland Appendix of King County, FEIS, 2000a). The wetlands are rated by the local jurisdiction as Class 2 based on area and habitat features, and require 50-foot buffers.

These wetlands range in size from 0.2 acre to greater than 5.0 acres and generally extend outside of the corridor. Overall, emergent and scrub-shrub vegetation classes are more prevalent than forested, although a few have significant forested portions. The wetlands are important in providing wildlife habitat and protecting fish habitat in the adjacent streams. Some may provide off-channel refuges for migrating and rearing fish during winter and spring flood and high flow periods. Important habitat support functions provided by the wetlands include organic matter production, water temperature attenuation through shading, and water quality improvement through sediment trapping and nutrient cycling. Critical hydrologic functions include stormwater and flood storage, retention, or conveyance; and base flow support. Currently, many of the wetlands are functionally degraded by the dumping of yard waste, construction debris, and other trash. In some, substantial vegetation disturbances (clearing or mowing) also reduce the function of these wetlands.

Wetlands Associated With Perennial Streams

Nine wetlands in the project area are associated with perennial streams that do not appear to provide salmonid fish habitat (see Wildlife and Fish Section 3.4). Most streams originate east of the Sammamish Parkway and flow through the corridor to the lake, while the wetlands generally occur entirely within the corridor. The wetlands are rated by the local jurisdiction as Class 2 or Class 3 depending upon size and number of vegetation classes present, and have 50- or 25-foot buffers, respectively. Two wetlands are less than 2,500 square feet each and are not rated.

These wetlands provide habitat for non-salmonid fish species (see Wildlife and Fish Section 3.4). They may also contain still pools and other aquatic habitat for breeding and rearing amphibians. These wetlands trap sediment, facilitate nutrient transformation, and reduce the amounts of nutrients contained in stormwater runoff and thus provide water quality benefits to the lake. Dumping of yard waste and other debris and some vegetation removal has impaired these wetland functions.

Wetlands Associated with Intermittent Drainages and Hillside Seeps

At many locations in the corridor, wetland hydrology results from groundwater discharge from slopes adjacent to the railbed (see Wetland Appendix of King County, FEIS, 2000a). Generally, small streams originate in the seep wetlands and drain directly to the lake, or join with larger drainages in the corridor. The wetlands are usually entirely contained within the corridor. Generally, they are rated as Class 3 wetlands. Some have forested vegetation and are therefore rated as Class 2 wetlands.

The seep wetlands typically have emergent vegetation with reed canarygrass, the most predominant of the emergent species present. This and other vegetation serves to retain sediments, and to stabilize the erosive slopes often associated with hillside seeps. The resulting clean discharge water contributes to maintaining good lake and stream water quality, including cool temperatures. Generally, the seep habitats are suitable for breeding and rearing of some species of amphibians.

Isolated Wetlands

Three wetlands are hydrologically isolated, meaning they do not drain to surface water and are not contained in a 100-year floodplain (see Wetland Appendix of King County, FEIS, 2000a). The isolated wetlands are small and entirely contained in the corridor. They are rated by King County or the local jurisdiction as either Class 3 or Type IV depending on the jurisdiction where they occur.

The isolated wetlands collect surface runoff, and provide sediment trapping and nutrient cycling resulting in water quality improvement. Water that collects in these wetlands ultimately drains to the lake via subsurface flow. Seasonal ponding may provide amphibian rearing and breeding habitat for some species.

APPENDIX D
FISH AND WILDLIFE

FISH AND WILDLIFE

AFFECTED ENVIRONMENT

Wildlife

Regulations

Various federal, state, county, and city regulations address the protection of wildlife in the project area (Table D-1). In most cases, city and county regulations reflect Washington Department of Fish and Wildlife (WDFW) recommendations.

Table D-1. City, County, State, and Federal Regulations.

Regulation	Overseeing Agency	Wildlife and Fish Species and Habitats Addressed
Federal		
Federal Endangered Species Act (ESA)	National Marine Fisheries Service (NMFS) U.S. Fish and Wildlife Service (FWS)	All federally-listed threatened and endangered species and critical habitats.
National Environmental Policy Act (NEPA)	Varies	All wildlife and fish.
Federal Migratory Bird Treaty Act	FWS	Most birds.
Fish and Wildlife Coordination Act	FWS; WDFW	All wildlife and fish.
Sustainable Fisheries Management Act	NMFS	All fish
Clean Water Act	Environmental Protection Agency	All fish
State		
Washington State Environmental Policy Act (SEPA)	King County	All wildlife and fish.
Washington State Endangered Species Act	WDFW	All state-listed threatened and endangered species.
Washington State Fish and Game Code	WDFW	All state-listed Priority Habitats and Species
Shoreline Management Act	Washington Department of Ecology	All fish and wildlife
County and City[1]		
King County Sensitive Areas Ordinance, Code Chapter 21A.24	King County	Critical or outstanding habitat for state or federal designated endangered or threatened species; designated stream and wetland habitats; designated wildlife habitat corridors.
King County Comprehensive Plan	King County	Designated fish and wildlife habitat conservation areas; habitats for state- or federally-listed endangered, threatened, or sensitive species; habitat for species of local importance.

Regulation	Overseeing Agency	Wildlife and Fish Species and Habitats Addressed
King County Surface Water Design Manual, Special District Overlay, SO-200	King County	Great blue heron rookeries.
Redmond Sensitive Areas Ordinance, Code Chapter 20D. 140	City of Redmond	Streams and their associated buffers; wildlife habitat.
Redmond Comprehensive Plan	City of Redmond	Habitats for state- or federally-listed endangered, threatened, sensitive, candidate, or other priority species; Class 1 wetlands and streams.
City of Issaquah Sensitive Areas Ordinance, Code Chapter 18.10.340	City of Issaquah	Wildlife and wildlife habitat; Class 1 streams and Class 1 and 2 wetlands; especially state- or federally-listed threatened or endangered species and their habitats; WDFW priority species.

[1] The City of Sammamish was recently incorporated and does not yet have a sensitive areas ordinance or Comprehensive Plan. The City will apply King County's regulations until the City adopts its own regulations.

Cover types along the project area were identified using aerial photography and field reconnaissance. In general, areas within 30 feet of either side of the proposed trail alignment were categorized into cover types, and individual patches were digitized using GIS. A patch is defined as an area of relatively homogenous vegetation that can be classified as a particular cover type. In some cases, areas extending beyond 30 feet from the proposed trail alignment were also classified (e.g., where a single patch extended beyond the 30-foot boundary, or where vegetation beyond the 30-foot boundary could be easily classified). The minimum mapped patch size was generally one-half acre, although smaller patches of large cottonwoods (minimum three large trees) were also distinguished, because they provide important perch and nest sites for bald eagles (threatened species) and other raptors.

Urban Matrix

Urban matrix is the most abundant cover type in the project area (see Figures 3-A, 3-B, 3-C, 3-D, 3-E, 3-F, 3-G, 3-H, 3-I, and 3-J, the GIS maps at end of Chapter 3). The cover type contains a mix of buildings, asphalt, ornamental gardens, lawns, and shrubby/grassy areas with scattered trees. Naturally occurring trees are deciduous, such as big leaf maple (*Acer macrophylum*), which are generally 20 to 40 feet tall. Dominant shrubs are Himalayan blackberry (*Rubus discolor*), Scot's broom (*Cytisus scoparius*), and a variety of ornamental species. Unmown grassy areas are dominated by non-native pasture species.

Wildlife species present in the urban matrix cover type are habitat generalists that are adapted to a wide variety of conditions. Characteristic species include European starlings, American robins, American crows, dark-eyed juncos, spotted towhees, house finches, house sparrows, black-capped chickadees, opossums, raccoons, deer mice, and Norway rats.

Deciduous Tree Cover

This cover type consists of mostly deciduous trees (Oregon ash *[Fraxinus latifolia]*, black cottonwood *[Populus trichocarpa]*, and bigleaf maple) with an understory of swordfern *(Polystichum munitum)*, salal *(Gaultheria shallon)*, Himalayan blackberry, and salmonberry *(Rubus spectabilis)*. Trees are generally more than 40 feet tall, and some cottonwoods reach more than 150 feet in height. Deciduous tree cover is scattered throughout the project area and includes both riparian and upland areas (see Figures 3-A, 3-B, 3-C, 3-D, 3-E, 3-F, 3-G, 3-H, 3-I, and 3-J, the GIS maps at the end of Chapter 3). Forested wetlands are included in the wetland cover type.

Wildlife species associated with the deciduous tree cover type include a variety of songbirds and raptors, small mammals, and a few species of amphibians and reptiles. Deciduous trees and shrubs provide nesting habitat, cover, and forage for songbirds such as warbling vireos, orange-crowned warblers, song sparrows, spotted towhees, black-throated gray warblers, black-headed grosbeaks, and western tanagers (a species observed in the area by residents – Eychaner, 1999). Deciduous areas along streams also provide habitat for beavers. Large cottonwoods present in this cover type are particularly important as perch and nest sites for raptors, such as red-tailed hawks and bald eagles. Bald eagles are a federally-listed threatened species and their occurrence in the project area is described in greater detail in a Threatened and Endangered Species section below. Amphibians and reptiles expected to occur in the deciduous tree cover type include common garter snakes and possibly ensatinas (salamanders).

Coniferous Tree Cover

This cover type consists of mostly coniferous trees (Douglas fir *[Pseudotsuga menziesii]*, western red cedar *[Thuja plicata]*, and western hemlock *[Tsuga heterophylla]*) with an understory of swordfern, low Oregon grape *(Barberis nervosa)*, Himalayan blackberry, and English ivy *(Hedera helix)*. Trees in this cover type are generally 40 to 80 feet tall. In the project area, coniferous tree cover occurs as small patches (up to approximately 2 acres) in upland areas (See Figures 3-A, 3-B, 3-C, 3-D, 3-E, 3-F, 3-G, 3-H, 3-I, and 3-J, the GIS maps at end of Chapter 3).

Wildlife species characteristic of the coniferous tree cover type include ruby-crowned kinglets, Steller's jays, red-breasted nuthatch, pileated woodpeckers, vagrant shrews, and shrew-moles. Pileated woodpeckers are a state-listed monitor species, and their occurrence in the project area is described in greater detail later in this section. During winter, coniferous trees provide important cover for a variety of birds, such as black-capped chickadees, Steller's jays, American robin, and song sparrows.

Wetlands

This cover type varies considerably in vegetation cover. Mature deciduous trees dominate a large forested wetland system at the north end of Lake Sammamish (Wetland 34A through D). Other wetlands in the project area are smaller, and include forested, shrub, and emergent habitats (see Figures 3-A, 3-B, 3-C, 3-D, 3-E, 3-F, 3-G, 3-H, 3-I, and 3-J, the GIS maps at end of Chapter 3). Wetlands are further described in Section 3.3, Plants and Wetlands.

Wildlife species characteristic of wetlands in and along the project area include great blue herons, mallards, Canada geese, belted kingfishers, red-winged blackbirds, willow flycatchers, Bewick's wrens, Pacific treefrogs, and western terrestrial and common garter snakes. Wetland 34A through D is expected to provide foraging habitat for beavers and muskrats, and breeding habitat for long-toed salamanders. A raptor nest, likely a red-tailed hawk nest, is also present, and this wetland occurs within a bald eagle nesting territory. Another large wetland, which contains emergent, forested, and open water habitats, is adjacent to the trail at Lake Sammamish State Park (Wetland 4A through E). The emergent wetland area is dominated by reed canarygrass *(Phalaris arundinacea)* and provides habitat for Canada geese, striped skunks, long-tailed weasels, creeping voles, Townsend's moles, vagrant shrews, Townsend's voles, and northwestern garter snakes. Red-tailed hawks and northern harriers are expected to hunt for garter snakes and small mammals in this area. The open water component of the wetland provides habitat for mallards, gadwalls, buffleheads, and other waterfowl. Area residents report observing river otter and wood ducks (presumably in open water and wetland areas) in the trail corridor vicinity (Eychaner, 1999).

Threatened and Endangered Species

This section describes threatened, endangered, and other species of state and federal concern that are known to occur or may occur in the project area vicinity.

Species with Federal Status

The U.S. Fish and Wildlife Service (USFWS) identified the bald eagle, a threatened species, as occurring in the vicinity of the trail corridor (Wildlife Appendix of King County, FEIS, 2000a). The agency also listed the peregrine falcon as an endangered species that may occur during migration in the project vicinity. However, since the time that USFWS provided this information, peregrine falcons have been removed from the endangered species list and are now considered a federal species of concern. The agency also identified one candidate species and five other species of concern as potentially occurring in the area (FWS, 1999). Only one of these species, the western pond turtle, is expected to occur in the project vicinity. Habitat for the other five candidate species or species of concern is not available in the vicinity (Wildlife Appendix, King County, FEIS, 2000a). Descriptions of species with federal status that are likely to use the project vicinity are provided below.

Bald Eagle. Bald eagles generally occur along shores of saltwater and fresh water lakes and rivers that support substantial prey densities (generally anadromous fish or waterfowl) (Livingston et al., 1990; Stalmaster, 1987). Breeding bald eagles use large trees for nesting that are generally within a mile of water and have an unobstructed view of water (ODFW, 1996; Anthony and Isaacs, 1989). Nest trees are usually within old-growth or residual old-growth stands, but some nesting also occurs in riverine and lakeside forests dominated by cottonwood (ODFW, 1996). Both breeding and wintering bald eagles forage over open water and use riparian trees, often cottonwoods, for perching.

Area residents report observing bald eagles in the trail corridor vicinity (Eychaner, 1999), and WDFW (1999a) has identified two bald eagle breeding territories in the area. The breeding territory on the south side of Lake Sammamish encompasses the trail corridor and contains one

nest site, which is about 0.25 mile from the trail and is not within line-of-sight. The breeding territory on the north side of the lake, which also encompasses the trail, contains a nest in Marymoor Park, about 630 feet from the proposed trail. The nest is within line of site of the trail when deciduous trees lack leaves. Wintering bald eagles forage along Lake Sammamish and perch in large cottonwood trees in the trail vicinity.

Peregrine Falcon. The peregrine falcon, a species of concern, nests on coastal cliffs and rocks, especially on the outer coast and on the San Juan Islands (Smith et al., 1997). This species also nests in suitable locations in the Puget Sound, and one pair has been nesting in downtown Seattle since 1994. Peregrines feed on smaller birds and often forage in areas with large shorebird and waterfowl concentrations (WDFW, 1999b). Suitable nesting habitat (i.e., cliffs) does not occur in the trail vicinity, but spring and fall migrant peregrines may use the area as they track migrating waterfowl and shorebirds.

Western Pond Turtle. The western pond turtle, a species of concern, occurs in streams, ponds, lakes, and permanent and ephemeral wetlands (Brown et al., 1995). This highly aquatic species spends most of its time in water but also requires terrestrial habitats for nesting, overwintering, and dispersal (WDFW, 1993a). Western pond turtles use floating vegetation, logs, rocks, and mud or sand banks for basking. Their historical distribution was from Mexico north to the Puget Sound (Brown et al., 1995). However, in recent years, the species has been nearly eliminated from the Puget Sound region, largely due to habitat alteration and loss, disturbance from humans, and introduction of non-native predators (WDFW, 1993a). Surveys indicate that only two viable populations remain in Washington state, one in Skamania County and another in Klickitat County (WDFW, 1993a). However, two western pond turtles have been sighted in the Marymoor Park wetlands, on the northwest side of Lake Sammamish (WDFW, 1999a). These turtle locations are approximately 1,320 feet and 1,650 feet from the trail.

Species with State and/or Local Status

One state-listed endangered species, the western pond turtle, and one threatened species, the bald eagle, are known to occur in the vicinity of the trail (WDFW, 1999a). Peregrine falcons, a state-listed endangered species and a federal species of concern, may use the area during migration. These species are discussed above. One candidate species for listing, the purple martin, and two state monitor species, the great blue heron and the pileated woodpecker, are known to occur in the project vicinity (WDFW, 1991). The red-tailed hawk, a species afforded special protection by King County and the cities of Redmond, Issaquah, and Sammamish, is also present in the project area.

Purple Martin. The purple martin is a summer resident of the Puget Sound area. This species breeds primarily near water and feeds on insects in open areas, often near moist and wet sites (WDFW, 1991). Their presence appears to be limited by the availability of nesting cavities. A purple martin nest box is located near the north end of Lake Sammamish, about 650 feet from the trail. The WDFW records indicate that active nests have been found in this box, as well as in a cavity in nearby remnant pilings from an old cedar mill (WDFW, 1999a).

Great Blue Heron. The great blue heron is associated with both fresh and saltwater wetlands, seashores, rivers, swamps, marshes, and ditches (WDFW, 1999b). This species feeds on aquatic and marine animals in shallow waters and occasionally preys upon mice and voles

(Calambokidis et al., 1985; Butler, 1995). Nests of these colonial breeders are usually constructed in the tallest trees available at a given site (WDFW, 1999b). Great blue herons are frequently sighted in wetlands adjacent to the trail and two rookeries are located near the trail (Eychaner, 1999; WDFW, 1999a). One rookery is south of Lake Sammamish at Lake Sammamish State Park, about 1,320 feet west of the trail. The other rookery is near the Sammamish River, about 4,000 feet (0.75 mile) from the northern terminus of the trail.

Pileated Woodpecker. The pileated woodpecker is generally associated with older forests that have large trees, snags, and coarse woody debris (Aubry and Raley, 1993; Nelson, 1988). This species is a primary cavity nester and uses large live trees and snags for nesting and feeding (Bull, 1987; Nelson, 1988). A pileated woodpecker call was heard near Sulphur Point during site visits to the project area in spring 1999, and one was observed in Wetland 29C during a site visit in January 2000. Area residents also report seeing pileated woodpeckers in the vicinity of the proposed trail (Eychaner, 1999).

Red-tailed Hawk. The red-tailed hawk is primarily associated with forest and woodland edges (Shuford, 1993). Nests are usually in large trees within open woods or small woodlots that provide good views of surrounding areas (Shuford, 1993; WDFW, 1993b). Unobstructed access to the nest and isolation from disturbance are generally important nest site characteristics as well. However, active nests have been documented in areas with a high degree of disturbance, such as along the Interstate 5 corridor (Smith et al., 1997). Open fields and grasslands with suitable foraging perches, serve as hunting areas, and main prey items are small mammals, birds, and snakes (Shuford, 1993; WDFW, 1993b; Preston and Beane, 1993). In the urban environments of Puget Sound, garter snakes appear to be the primary prey of these hawks (Thompson, personal communication, 2000). During field visits in spring 1999 and January 2000, red-tailed hawks were observed in the vicinity of the grassy wetland (Wetland 4A through E) in Lake Sammamish State Park and in the northern part of the forested wetland (Wetland 34A through D) in Marymoor Park. In addition, a raptor nest, likely a red-tailed hawk nest, was located in this wetland during January 2000. The nest is about 630 feet from the proposed trail and is within line-of-sight of the trail when the deciduous trees are not leafed out. Downy feathers and droppings below the nest tree indicate that the nest site was active in 1999. In spring 2000, bald eagles used this nest site.

Fish

Following is a discussion of known fish resources in these nine streams.

George Davis Creek

Identified as a salmonid bearing stream, no current information on salmonid usage is provided for George Davis Creek (No. 0144) by the resource agencies, although it is believed to support coho salmon (rearing), cutthroat trout (spawning and rearing), and rainbow trout (spawning and rearing) (Williams et al., 1975; King County, 1990b). The creek is 3.46 miles in length, with only 0.4 mile accessible by anadromous fish (King County, 1990b). A segment of the creek below the proposed Interim Use Trail has been piped beneath a house, which also acts as a barrier to fish passage (Ecology, 1994). At one time this stream likely supported coho, kokanee and/or sockeye salmon in the lower reaches prior to the creation of fish barriers near the mouth. Sedimentation in the lower reaches and the stream culvert under the residence limit the amount

of usable salmonid habitat in the lower 0.40 mile. Above the project corridor, the stream encounters a culvert under East Lake Sammamish Parkway which also creates a barrier to salmonid migration, and a second culvert barrier at rivermile (RM) 0.81 (King County, 1990b). Upstream of the project corridor, between RMs 0.2 and 0.8, the stream channel contains sufficient amounts of large woody debris and habitat conditions that are generally favorable for salmonids (Ecology, 1994).

Zaccuse Creek

Identified as a salmonid bearing stream, no specific information on salmonid usage is provided for Zaccuse Creek (No. 0145A) by the resource agencies, although it is believed to support coho salmon (rearing) and cutthroat trout (spawning and rearing). The creek is 1.18 miles in length, with only 0.05 mile accessible by anadromous fish (King County, 1990b). There is a culvert barrier at East Lake Sammamish Parkway (King County, 1990b). At one time this stream may have supported coho, kokanee and/or sockeye salmon in the lower reaches prior to the creation of fish barrier(s) near the mouth. The creek flows under the railbed in a 36-inch concrete culvert, which is in good condition. Field personnel did not observe sediment in the culvert or blockage downstream of the trail. The culvert beneath the project corridor at this creek may act as a fish barrier due to excessive water velocities caused by an oversteepened streambed slope at its inlet, internal steepness and lack of coarseness of the culvert bottom, and a constricting effect of the culvert during fall/winter flows (White, 1999).

Ebright Creek

Ebright Creek (No. 0149) is known to support coho (spawning and rearing), kokanee, and sockeye salmon (spawning) in the lower reaches below a fish barrier, and cutthroat trout (spawning and rearing) and rainbow trout (spawning and rearing) throughout the creek (King County, 1990b). The creek is 2.65 miles in length, with 0.45 mile accessible by anadromous fish (King County, 1990b). A small dam blocks passage at RM 0.45. Below the barrier, the creek possesses characteristics that favor coho salmon spawning and rearing, and sockeye and kokanee salmon spawning (King County, 1990b). Further upstream, the gradient at times approaches five percent through the ravines, forming tiered or staircase features that result in patch gravel and small volume pools that are favored by trout (King County, 1990b). Upstream from East Lake Sammamish Parkway, the creek was identified as having an erosion problem upstream to the impassible barrier at RM 0.45 (Ecology, 1994). Bed and bank erosion in the upper and middle reaches of Ebright Creek result in sedimentation of lower reach salmonid spawning and rearing habitat and of culverts under East Lake Sammamish Parkway (Ecology, 1994). Field observations indicated that, at the railbed, the creek flows through two 36-inch concrete culverts, both of which are in good condition and unblocked (Parametrix, 1999).

Pine Lake Creek

Records indicate Pine Lake Creek (No. 0152) is a 2.84-mile-long creek that supports coho salmon (spawning and rearing), sockeye salmon (spawning), and kokanee salmon (spawning) in the 0.60-mile accessible lower reach of Pine Lake Creek below an artificial fish barrier approximately 0.75 mile upstream. The 1.80-mile accessible lower reach of Kanim Creek (No. 0153) also contains spawners (Williams et al., 1975; King County, 1990b). Resident cutthroat

trout (spawning and rearing) and rainbow trout (spawning and rearing) are reportedly found throughout the creek to its headwaters, with resident-only fish present above RM 1.80 (King County, 1990b). Excellent riffle/pool habitat remains, especially where the creek descends from the plateau to Lake Sammamish. At the railbed the creek is diverted under the railroad ballast through two 36-inch concrete culverts. One of the culverts is partially filled with gravel at the upstream opening.

Unnamed Stream No. 0163

Identified as a salmonid bearing stream, no current information on salmonid usage is provided for this unnamed stream by the resource agencies, although it is believed to be suitable for coho salmon (rearing), cutthroat trout (spawning and rearing) and rainbow trout (rearing) (King County, 1990b). This stream is 0.70 mile in length with only 0.10 mile accessible to non-resident fish (King County, 1990b). There are impassable barriers at East Lake Sammamish Parkway and approximately 400 yards upstream from the road. At one time this stream likely supported kokanee and/or sockeye salmon in the lower reaches prior to the creation of the fish barrier(s) near the mouth. Stream No. 0163 passes through the railbed in a single 24-inch clay culvert, which is in fair condition, although partially blocked (6 to 8 inches) with sediment at the outlet. The stream passes through a 36-inch concrete culvert, which is broken on the east end. The inlet is heavily vegetated and water flow may be blocked. The outlet is partially blocked with sediment. Above the project corridor, the stream is placed in a culvert under East Lake Sammamish Parkway, which creates a barrier to salmonid migration (King County, 1990b).

Laughing Jacobs Creek

Available information indicates Laughing Jacobs Creek (No. 0166) supports coho, sockeye, and kokanee salmon, and cutthroat trout in the lower reach (which includes the railbed crossing at mile 0.5), and cutthroat trout throughout most of its length (King County, 1990b). A natural fish barrier exists approximately one mile upstream from Lake Sammamish. The existing stream crossing on the project corridor consists of a low-rise wooden span supported by wood pilings set along both sides of the stream channel with additional supports placed in the middle of the channel. The bridge appears to be in good condition and would not likely require extensive retrofitting for trail use. Just upstream from the crossing, Laughing Jacobs Creek flows underneath East Lake Sammamish Parkway SE through two open-bottom culverts.

Many Springs Creek

Although identified as a salmonid bearing stream, no current information on salmonid usage is provided for Many Springs Creek by the resource agencies, although it is believed to be used by coho salmon (rearing) and cutthroat trout (spawning and rearing) (King County, 1990b). The main stem of the creek (No. 0164A) is 0.86 mile in length, with only 0.27 mile accessible to non-resident fish. A waterfall at RM 0.27 blocks all upstream passage on this tributary. There is a tributary (No. 0164B) which provides 0.38 mile of habitat to resident fish only (King County, 1990b). At one time this stream likely supported kokanee and/or sockeye salmon in the lower reaches. The creek flows beneath the proposed trail corridor in a 24-inch CMP which is in good condition. However, the culvert is partially blocked (6 to 10 inches) with sediment.

North Fork Issaquah Creek

Coho, fall chinook, sockeye, and kokanee salmon, and cutthroat trout use the lower reach of North Fork Issaquah Creek (No. 0181), which includes the project corridor crossing. A short distance downstream, North Fork Issaquah Creek flows into Issaquah Creek which supports the largest numbers of salmon in the Lake Sammamish drainage. The existing stream crossing consists of a low-rise wooden span supported by wood pilings set along both sides of the stream channel. The design does not appear to impede fish passage. The bridge appears to be in good condition and would not likely require extensive retrofitting.

Non Fish-Bearing and Unknown Fish Use Streams

Approximately 52 small, mostly intermittent waterways pass beneath the railbed. Most convey water into or out of wetlands. Some may offer habitat suitable for fish but have not been adequately surveyed, particularly below the rail grade, primarily due to access impediments. Others carry seasonal runoff, or flow only during periods of heavy rainfall. Fish species likely to be present in a few of these streams include cutthroat trout, threespine stickleback, speckled dace, sculpins, or brook lamprey, depending on site-specific habitat conditions. Many of the smaller waterways offer habitat for amphibians, and a wide variety of invertebrates. They are important components of the wetland environments found along the rail route, providing habitat and food for a wide variety of wildlife.

Regulatory Environment

Various federal, state, county, and city regulations that address the protection of fish in the project area were listed above in Table D-1. In most cases, city and county regulations reflect Washington Department of Fish and Wildlife (WDFW) recommendations.

Threatened and Endangered Fish Species

Species with Federal Status

Recently, public attention has focused on the listing of some Puget Sound salmonid stocks as threatened or endangered under the federal Endangered Species Act (ESA). Threatened and endangered fish that could be affected by the project include chinook salmon and bull trout. Other fish species with federal status that occur within the project area vicinity include coho salmon, which are a candidate for listing, and Pacific and river lamprey, which are federal species of concern. These species are described in further detail below.

Chinook Salmon. Chinook salmon in Puget Sound, including the project area vicinity, were listed as threatened in March 1999 (NMFS, 1999). Chinook salmon stocks are generally described according to the season that they return to fresh water as mature adults. Although three distinct run-times, spring, summer, and summer/fall, are frequently described in the literature, only summer/fall stocks occur within the project area vicinity (WDF et al., 1993). Chinook salmon are known to occur within Lake Sammamish. Their current use of North Fork Issaquah Creek is problematic. Summer/fall chinook salmon migrate into fresh water in August and September (Wydoski and Whitney, 1979). Spawning begins in late September and peaks in

October, similar to other chinook salmon stocks in south Puget Sound (WDF et al., 1993). Following spawning, chinook salmon eggs hatch in about two months, though the amount of time required for incubation depends primarily upon water temperatures (Wydoski and Whitney, 1979; Healey, 1991).

Juvenile chinook salmon typically rear in fresh water for a couple months and migrate downstream in the spring; however, in lake systems such as Lake Sammamish, some individuals may rear in fresh water for longer periods (Wydoski and Whitney, 1979). Studies in Lake Washington suggest that most juvenile chinook are typically found in the littoral zone during early February to early June (Muckleshoot Indian Tribe Fisheries Department (MITFD) et al., 1999). MITFD (1999) found the greatest catches of chinook occurred during June. The majority of the diet of juvenile chinook salmon while in fresh water consists of invertebrates. Chinook salmon generally feed on insects in the water column or drifting at the surface (Healey, 1991). Chinook probably consume chironomids and other aquatic and terrestrial insects, especially in areas where riparian vegetation is adjacent to the lake shoreline. Habitat characteristics important to chinook salmon include large accumulations of gravel for spawning, and estuarine habitats for marine growth and survival. In addition, stable stream flows are required for egg incubation that occurs throughout the winter and into March (Healey, 1991).

Coho Salmon. Coho salmon have been a candidate for listing in Puget Sound since 1995 (NMFS, 1995). Coho salmon occur in Lake Sammamish, and nine of the project area streams. Coho salmon rear in fresh water for approximately 18 months and outmigrate to estuaries during spring freshets, typically from April through June. Smolts mature in the marine environment for another 18 months before returning to spawn as 3-year-old adults. Adult coho salmon of Lake Sammamish stocks enter fresh water from mid-September to mid-November and spawn from late October through late February (WDF et al., 1993). Freshwater habitat requirements of adult coho salmon includes access to spawning areas. Adults spawn in a variety of habitats and use substrates from fine gravel to rubble in waters less than 3 feet deep.

Shortly after emergence and a brief period of schooling behavior, coho fry become very territorial and typically maintain distinct feeding territories during daylight hours (Sandercock, 1991). Some coho may remain in the same tributary for a full year before they migrate downstream. Stream habitats required by juvenile coho salmon include pools and side channels for rearing. Access to deep pools and cover in the form of large woody debris or undercut banks increases overwinter survival of coho salmon rearing in streams. Others may migrate downstream to larger streams or possibly to a lake to continue rearing.

Bull Trout. Bull trout were listed as threatened in the coterminous United States in December 1999 (USFWS, 1999). Bull trout exhibit multiple migratory strategies, commonly occupy patchy distributions, and are associated with cool water and complex habitats. Bull trout spawn from August through November, depending on location, and embryos incubate throughout the winter. Emergence occurs from early April through May, and fry are bottom dwellers that occupy interstitial spaces of the streambed (Brown, 1994). Resident forms of bull trout spend their entire lives in fresh water, while anadromous forms live in tributary streams for

2 or 3 years before migrating to estuaries as smolts. Char[2] are generally longer-lived than salmon, and bull trout up to 12 years old have been identified in Washington (Brown, 1994).

Bull trout were historically distributed throughout the central Puget Sound region, including a portion of the current Lake Washington basin (Goetz, 1994). No spawning populations are known to occur in Lake Sammamish or its tributaries (WDFW, 1998; USFWS, 1998c). However, B. Fuerstenburg (personal communication in USFWS, 1998c) believes he observed two native char in Issaquah Creek in 1993, and there have been a few reports of native char in the Lake Washington basin (USFWS, 1998c). Several large char (approximately 410 mm long) have been observed passing through the viewing chamber at the Chittenden Locks, but in a two-year creel survey of Lake Washington in 1981 to 83 only one was identified from the sport fishery (Bradbury and Pfeifer, 1992; USFWS, 1998c). The lack of evidence of spawning populations in the Lake Washington/Lake Sammamish basins suggests that these fish may have originated in other basins and perhaps were foraging in the basin. Although their exact distribution in the Lake Washington/Lake Sammamish Basin is uncertain, they appear to have an irregular presence in the lower Lake Washington/Lake Sammamish basin, in minor numbers.

River Lamprey. River lamprey are a federal species of concern. These fish are anadromous and parasitic in both fresh and marine waters. Little is known about the fresh water life of river lamprey. River lamprey spawning occurs in the spring (late April through May). When the young (ammocoetes) hatch, they bury themselves in mud and sand where they remain for an unknown period (Wydoski and Whitney, 1979; Scott and Crossman, 1998). The affected stream environment for river lamprey is the same as described above for chinook salmon. River lampreys have been identified in Lake Sammamish adjacent to the project area (WDFW file records, Mill Creek).

Pacific Lamprey. Pacific lamprey is also a federal species of concern. Similar to river lamprey, Pacific lamprey are anadromous and parasitic while in marine waters; very little is known about the fresh water life of these fish. Pacific lamprey spawning occurs in spring or summer (May through September, depending on latitude), and ammocoetes rear in fresh water up to six years before migrating to the Pacific Ocean (Wydoski and Whitney, 1979; Scott and Crossman, 1998). Pacific lamprey may occur in the project area vicinity; however, no population specific information is available within the Lake Washington/Lake Sammamish basin. Pacific lamprey are seen in area rivers and larger tributaries in May or June (WDFW file records, Mill Creek).

Priority Fish Species

Priority fish species include all state endangered, threatened, sensitive, and candidate species; and species of recreational, commercial, or tribal importance that are considered vulnerable. All fish species with state candidate status that occur in the project area vicinity also hold a federal designation and were discussed in the preceding paragraphs. No state sensitive, threatened or

[2] For purposes of fisheries management, the WDFW does not differentiate between Dolly Varden and bull trout and, where necessary for the purposes of ESA, considers the State's native char populations to be predominantly bull trout.

endangered fish species occur within the project area. Other fish species that are designated as Priority Species (WDFW, 2000) may occur within the project area vicinity. These include: chum, sockeye, and kokanee salmon, rainbow/steelhead trout, coastal cutthroat trout, white sturgeon, largemouth bass, smallmouth bass, and longfin smelt. These species are briefly discussed in the following paragraphs.

Kokanee (sockeye) Salmon. Sockeye and kokanee salmon are the anadromous and freshwater-resident forms of the species *O. nerka*, respectively. Kokanee and sockeye salmon co-occur in Ebright, Pine Lake, Laughing Jacobs, and North Fork Issaquah creeks. Kokanee and sockeye spawn timing overlaps in all of these creeks (sympatric populations).

Kokanee are native to the Lake Washington / Lake Sammamish basin (Seeb and Wishard, 1977; Wishard, 1980; Hendry, 1995; King County, 2000b). In Lake Sammamish they mature primarily at four years of age (range three to five). At least two races occur in Lake Sammamish, based on spawn timing: early run, and late run. Early run fish currently spawn predominantly in Issaquah Creek from late July to early September. Late run fish spawn from late September or early October through December. There is a distinct temporal separation between these two races in Issaquah Creek. After approximately 3.5 months of intragravel incubation, newly emerged fry migrate directly to Lake Sammamish for rearing until sexually mature.

Late entry kokanee currently utilize Ebright, Pine Lake, and Laughing Jacobs Creeks. Prior to development of the railbed along Lake Sammamish, many of the lake's east bank tributaries supported kokanee spawners (King County, 2000b).

An extreme reduction in abundance of the early entry race has prompted a petition to the USFWS for an emergency listing of the stock for protection under the Endangered Species Act (Save Lake Sammamish et al., 2000). As of April 24, 2000, the USFWS had not published an announcement in the *Federal Register* as to whether the petitioned action may be warranted.

Chum Salmon. No known reproducing populations of chum salmon occur within the project area vicinity. Small numbers of chum salmon are typically seen in mid-winter ascending the Chittenden Locks fishway at the west end of the Lake Washington Ship Canal. Their ultimate fate within the basin is unknown.

Rainbow Trout (Steelhead). Rainbow trout are the resident form of *O. mykiss*, while the anadromous form is referred to as steelhead. This species is sought by recreational fishers and is designated as a Priority Species (WDFW, 2000). Rainbow trout spawn and rear in Big Bear, George Davis, Ebright, Pine Lake, and Laughing Jacobs creeks. Rainbow trout are also found in many smaller drainages including streams 0153, 0163, and 0166A.

Coastal Cutthroat Trout. Coastal cutthroat trout have multiple life history forms, including resident, adfluvial, and anadromous. This species is sought by recreational fishers and is designated as a Priority Species (WDFW, 2000). Cutthroat trout spawn and rear in at least nine streams in the project area vicinity. Information on the status of Lake Washington/Lake Sammamish populations is lacking. However in a recent review of their coastwide status, NMFS declared the Puget Sound ESU not warranted for listing (NMFS, 1999). Indirect indices of their abundance in the two-lake system indicate a healthy, and possibly expanding population (Pfeifer,

1992; WDFW file data, Mill Creek). These fish are spring spawners and once they reach maturity will spawn annually thereafter.

White Sturgeon. White sturgeon are food fish and as a result are designated as a Priority Species (WDFW, 2000). White sturgeon are anadromous, and are the largest fish in the fresh waters of North America. These fish can grow to 20 feet long (Wydoski and Whitney, 1979). White sturgeon are a native species, but are probably rare in the project area vicinity. Very infrequent catches of large sturgeon in tribal gill nets in north Lake Washington in the 1970s were thought to reflect incidental captures of rare individuals that were "trapped" in Lake Washington at the time the lake was lowered. A breeding population in the Lake Washington system has not been verified.

Largemouth Bass. Largemouth bass are a non-native fish, which are important to the recreational fishery. Consequently they are a Priority Species (WDFW, 2000). The species was introduced to Washington by the U.S. Bureau of Fisheries in the 1890s (Wydoski and Whitney, 1979). Largemouth bass in Lake Washington mature at about age three, and spawn from mid-May until the end of June. While potentially present near the mouths of any of the streams crossed by the project corridor, most largemouth bass in Lake Sammamish are located near the lake's north and south ends (Pflug, 1981).

Smallmouth Bass. Smallmouth bass are also non-native, but are designated a Priority species because they are important to the recreational fishery (WDFW, 2000). This species is far more abundant in the Lake Washington/Lake Sammamish basin than largemouth bass. Smallmouth bass prefer rocky substrates, mature at age 3 or 4, and spawn in the spring months. They spawn and rear along much of the Lake Sammamish shoreline paralleled by the project corridor (Pflug, 1981).

Longfin Smelt. Longfin smelt are a native fish that exhibit anadromy but populations in Lake Washington complete their life cycle in fresh water. The species has been given a Priority Species designation (WDFW, 2000). These fish occupy the limnetic zone, and are typically found at night in water 36 to 72 feet below the surface from July to December. During the day adult longfin smelt move to depths 60 to 120 feet below the surface. Longfin smelt are short-lived spring spawners, and rarely live to age 3. While exceedingly abundant in Lake Washington, their status in Lake Sammamish is poorly understood.

APPENDIX E
TRANSPORTATION

TRANSPORTATION

AFFECTED ENVIRONMENT

Study Area

The proposed East Lake Sammamish Interim Use Trail is located on the railbed within the East Lake Sammamish railroad right-of-way, which is referred to as the corridor west of, and parallel to, East Lake Sammamish Parkway NE/SE. Public streets crossing the proposed Interim Use Trail include NE 65th Street in the City of Redmond; SE 33rd Street and 206th Ave SE in the City of Sammamish; and the Lake Sammamish State Park Entrance, SE 51st Street, SE 56th Street, SE 62nd Street, and Gilman Boulevard in the City of Issaquah and unincorporated King County. Public access to the railbed is provided at these public street crossings. State Route (SR) 520, Interstate-90 (I-90), Inglewood Hill Road, Louis Thompson Road, East Lake Sammamish Place, and SE 43rd Way are other key roadways in the study area. The entire East Lake Sammamish Interim Use Trail study area, including major roadways, is shown in Figure 1-1.

Three public parks, two developed and one undeveloped, are located adjacent to the proposed East Lake Sammamish Interim Use Trail. Marymoor Park, a King County regional park, is located at the north end of the trail and bounded by East Lake Sammamish Parkway NE, West Lake Sammamish Parkway NE, and SR-520. Marymoor Park provides a range of public recreation services and has parking and restrooms. Lake Sammamish State Park, located near the south end of the trail, is bounded by East Lake Sammamish Parkway NE, NW Sammamish Road/SE 56th Street, and Lake Sammamish. Lake Sammamish State Park provides a smaller range of public recreation services compared to Marymoor Park, and also has parking and restrooms. The City of Redmond has purchased waterfront property approximately 0.87 mile south of NE 65th Street for a future park. An additional 1,500 lineal feet of waterfront adjacent to the City of Redmond's parcel was donated to the City of Sammamish in October 2001. No specific development plans for these parks are available at this time.

Existing Roadway Characteristics

The key roadways in the study area, listed above and shown in Figures 2-1, 2-2, 2-3, 2-4, 2-5, 2-6, 2-7, 2-8, 2-9, and 2-10, or Figures 3-A, 3-B, 3-C, 3-D, 3-E, 3-F, 3-G, 3-H, 3-I, and 3-J (Site Assessment Maps at end of Chapter 3), are described in this section. Existing roadway characteristics are also summarized in Table E-1. Roadway classifications and volumes were obtained from the City of Redmond, King County (for roadways in the City of Sammamish), and the City of Issaquah.

SR-520 is an east-west freeway linking I-5 in Seattle to SR-202 in Redmond. In the project vicinity, SR-520 consists of four general-purpose lanes and has a speed limit of 60 mph. East Lake Sammamish Interim Use Trail not extend as far north as the SR-520/SR-202 interchange eastbound off-ramp.

SR-202 (Redmond-Fall City Road) is a four-lane highway connecting SR-520 in the City of Redmond with SR-203 in Fall City. SR-202 has a speed limit of 45 mph. The Interim Use Trail would be located just west of, and parallel to, SR-202 from NE 70th Street to East Lake Sammamish Parkway NE.

I-90 is the major east-west freeway for the northern United States. In the project vicinity, I-90 consists of six general-purpose lanes and has a speed limit of 60 mph. The interchanges nearest to the proposed trail are Exit 17 (Front Street) and Exit 15 (SR-900). I-90 passes over the railbed just west of Exit 17.

East Lake Sammamish Parkway is a north-south principal arterial connecting the cities of Redmond and Issaquah, and providing access to both SR-520 and I-90. North of approximately 212th Way, East Lake Sammamish Parkway consists of two travel lanes, shoulders on both sides of the roadway, and a speed limit of 35 mph. South of 212th Way, the roadway widens to four lanes. Between SE 43rd Way and I-90, the number of lanes varies between two and five, the speed limit varies between 25 and 40 mph, and sidewalks exist near some intersections. The Interim Use Trail would parallel East Lake Sammamish Parkway from SR-202 to I-90.

NE 70th Street is a two-lane street located west of SR-202 (Redmond-Fall City Road). NE 70th Street has a speed limit of 25 mph. The NE 70th Street/East Lake Sammamish Parkway intersection is signal-controlled. The Interim Use Trail would terminate on the south side of NE 70th Street just west of East Lake Sammamish Parkway.

NE 65th Street, located west of East Lake Sammamish Parkway, is a two-lane roadway with a speed limit of 25 mph. The NE 65th Street/East Lake Sammamish Parkway intersection is signal controlled. The Interim Use Trail would intersect with NE 65th Street just west of East Lake Sammamish Parkway.

Inglewood Hill Road is a two-lane arterial located east of East Lake Sammamish Parkway, with a speed limit of 35 mph. The Inglewood Hill Road/East Lake Sammamish Parkway intersection is signal-controlled. Inglewood Hill Road terminates at this intersection, and therefore does not intersect with the railbed located just west of East Lake Sammamish Parkway.

Louis Thompson Road is a two-lane arterial connecting East Lake Sammamish Parkway with 212th Way and has a speed limit of 35 mph. Louis Thompson Road terminates where it intersects with East Lake Sammamish Parkway, and therefore does not cross the railbed located just west of East Lake Sammamish Parkway.

East Lake Sammamish Place is an unstriped two-lane local access street serving residential uses west of East Lake Sammamish Parkway. The speed limit is posted at 25 mph, and intermittent shoulders and limited sidewalks exist. On-street parking occurs on some portions of this street.

SE 33rd Street is a two-lane residential street with no striping, shoulders, or sidewalks. SE 33rd Street intersects with the railbed, just west of East Lake Sammamish Parkway. The posted speed limit is 25 mph.

212th Way SE is a two-lane arterial connecting East Lake Sammamish Parkway SE (at a signalized intersection) to Louis Thompson Road. 212th Way SE terminates where it intersects

with East Lake Sammamish Parkway, and therefore does not intersect with the railbed located just west of East Lake Sammamish Parkway. The posted speed limit is 25 mph and no shoulders or sidewalks exist along the roadway.

SE 43rd Street is a three-lane arterial (two lanes eastbound, one lane westbound) with shoulders on the north side and a posted speed limit of 40 mph. SE 43rd Street connects to East Lake Sammamish Parkway at a signalized intersection and continues east to 228th Avenue SE. Because SE 43rd does not continue west of East Lake Sammamish Parkway, no intersection would exist with the Interim Use Trail (located just west of East Lake Sammamish Parkway).

NW Sammamish Road and SE 56th Street are functionally the same road, although the name changes at the East Lake Sammamish Parkway intersection. NW Sammamish Road, which connects East Lake Sammamish Parkway to West Lake Sammamish Parkway, is a four-lane arterial with a speed limit of 35 mph. SE 56th Street, which connects East Lake Sammamish Parkway to 230th Avenue SE, is a three-lane roadway with a posted speed limit of 25 mph. The Interim Use Trail would intersect with NW Sammamish Road just west of East Lake Sammamish Parkway.

SE 62nd Street is a two-lane local street with a speed limit of 25 mph. SE 62nd Street crosses East Lake Sammamish Parkway and the railbed.

Gilman Boulevard, located south of I-90 in the City of Issaquah, is a four-lane roadway with a speed limit of 35 mph. The southern terminus for the Interim Use Trail would be located at Gilman Boulevard.

Traffic Volumes

Average daily traffic (ADT) volumes from 1998 were obtained from the City of Redmond, the City of Issaquah, and King County for the study area roadways. These traffic volumes are shown in Table E-1. Most arterial roadways in the study area are operating at or near capacity. Average daily traffic volumes range from 9,200 vehicles per day (vpd) south of Louis Thompson Road to 31,800 vpd north of SE 56th Street. During peak hours, many intersections at the northern- and southern-most segments of East Lake Sammamish Parkway (near I-90 and SR-520) are operating at or near capacity.

Transit

At the southern end of the corridor, King County Metro transit routes 200, 215, and 269 stop adjacent to SE 56th Street, all within 200 feet of the railbed. At the northern end, routes 269 and 922 stop on SR-202 less than 0.25 mile from the railbed. Routes 200, 209, 214, and 215 stop on Gilman Boulevard in Issaquah. Route 269 is the only bus route servicing East Lake Sammamish Parkway within the study area, and makes only one stop in both directions at the SE 56th Street/East Lake Sammamish Parkway SE intersection.

Table E-1. Existing Roadway Characteristics

Roadway/Section	Lanes	Classification	ADT[1]	Speed Limit	Sidewalks/Shoulders
SR-520 before SR-202 ramps	4	State route	55,000	60 mph	shoulder both sides
SR-202 (Redmond-Fall City Road) Near SR-520	4	State route	na[2]	45 mph	shoulder both sides
I-90 west of Exit 17 ramps	6	Interstate	36,865	60 mph	shoulder both sides
East Lake Sammamish Parkway	2	principal arterial		25 to 40 mph	shoulder both sides
North of NE 70th Street	2	principal arterial	na	35 mph	shoulder both sides
South of NE 70th Street (north of 180th NE)	2	principal arterial	18,800	35 mph	shoulder both sides
North of NE 65th Street	2	principal arterial	na	35 mph	shoulder both sides
South of NE 65th Street	2	principal arterial	18,000	35 mph	shoulder both sides
North of Inglewood Hill Road	2	principal arterial	14,800	35 mph	shoulder both sides
South of Inglewood Hill Road	2	principal arterial	10,200	35 mph	shoulder both sides
North of Louis Thompson Road	2	principal arterial	11,100	35 mph	shoulder both sides
South of Louis Thompson Road	2	principal arterial	9,200	35 mph	shoulder both sides
South of East Lake Sammamish Place	2	principal arterial	na	35 mph	shoulder both sides
South of SE 33rd Street	2	principal arterial	na	35 mph	shoulder both sides
North of SE 43rd Street	2	principal arterial	15,300	25 to 40 mph	shoulder both sides
South of SE 43rd Street	4 to 5	principal arterial	30,300	25 to 40 mph	sidewalk both sides
North of SE 56th Street	4 to 5	principal arterial	31,800	25 to 40 mph	sidewalk both sides
South of SE 56th Street	2 to 3	principal arterial	18,900	25 to 40 mph	shoulder both sides[3]
North of Gilman Boulevard	2 to 5	principal arterial	17,600	25 to 40 mph	sidewalk both sides
South of Gilman Boulevard	2 to 4	principal arterial	11,700	25 to 40 mph	sidewalk both sides
NE 70th Street west of East Lake Sammamish Parkway	2	local	5,900	25 mph	sidewalk south side
NE 65th Street west of East Lake Sammamish Parkway	2	local	5,900	25 mph	sidewalk both sides
Inglewood Hill Road east of East Lake Sammamish Parkway	2	arterial	8,300	35 mph	shoulder both sides
Louis Thompson Road east of East Lake Sammamish Parkway	2	arterial	3,050	35 mph	shoulder both sides
East Lake Sammamish Place	2	arterial	na	25 mph	no sidewalk or shoulder
SE 33rd Street	2	residential	na	25 mph	no sidewalk or shoulder
212th Way SE northeast of East Lake Sammamish Parkway	2	arterial	4,200	25 mph	no sidewalk or shoulder
SE 43rd Way east of East Lake Sammamish Parkway	3	arterial	14,900	40 mph	shoulder north side
SE 56th Street west of East Lake Sammamish Parkway	3 to 6	arterial	29,100	25 to 40 mph	sidewalk both sides
SE 56th Street east of East Lake Sammamish Parkway	3	arterial	5,500	25 to 40 mph	sidewalk both sides
SE 62nd Street	2	local	na	25 mph	no sidewalk or shoulder
Gilman Boulevard west of East Lake Sammamish Parkway	4	minor arterial	11,200	35 mph	sidewalk both sides
Gilman Boulevard east of East Lake Sammamish Parkway	4	minor arterial	2,500	35 mph	sidewalk south side

[1]ADT Average Daily Traffic [2]na Not Applicable [3] Sidewalks exist at some intersections in this segment

Non-Motorized Facilities

Roadway shoulders ranging from 5 to 8 feet wide exist on both sides of East Lake Sammamish Parkway. These shoulders are used for bicycle and pedestrian travel, as well as parking in some areas. Sidewalks are provided for pedestrians only between SE 43rd Way and NW Sammamish Road/SE 56th Street, and north and south of the Gilman Boulevard/East Lake Sammamish Parkway intersection. Other than the on-street bicycle lane on SE 56th, no additional marked pedestrian or bicycle facilities are provided along roadways in the study area.

An existing pedestrian soft-surface trail connection exists between the railbed and Marymoor Park's east entrance on the north side of NE 65th Street. Pickering Trail is an 8 foot-wide asphalt trail extending from the multiple-use trail paralleling SE 56th Street to the railbed south of the foot bridge over Issaquah Creek.

Vehicle Access

Vehicle access to the railbed is prohibited. In some residential areas, vehicles were observed to be parked in the railbed, particularly in areas where boundaries between the railbed and residential access driveways are not clearly delineated.

Parking

Existing public parking in the study area is available at Marymoor Park, Lake Sammamish State Park, along NE 65th Street and on the roadway shoulder along the East Lake Sammamish Parkway. If necessary, a shared parking facility for trail users may be available at an existing office park on SE 51st Street or at the Issaquah District Court located on 220th Avenue SE (north of SE 56th Street).

Marymoor Park has 641 paved parking spaces and 1,351 unpaved parking spaces available year-round. Except during the winter months, the Park also contains 600 additional spaces. Peak usage for these parking lots occurs during the spring/summer season on weekend days. Some parking is available year-round. However, during summer special events such as the annual Heritage Festival and WOMAD music festival, fees may be charged for parking.

Lake Sammamish State Park has approximately 2,300 regular parking spaces near the picnic/swimming area available for trail users, and 250 boat/trailer parking spaces for boat/trailer use only. The boat/trailer parking area is frequently at capacity on spring/summer weekend days.

Thirty-four parking spaces are available along NE 65th Street. Parking is permitted only on the south side of the street, on-street parking is also available on both sides of NE 70th Street. Shoulder parking is permitted on both sides of East Lake Sammamish Parkway NE/SE from NE 65th Street to SE 43rd Street, but increased parking along the parkway would create additional safety hazards and invite use of private roads to access the trail.

The parking lot associated with the office park, leased by Microsoft, has approximately 1,000 parking spaces. The Issaquah District Court has approximately 80 parking spaces. If a shared parking agreement is established, these locations could provide trail users weekend use.

Railbed Crossings

As previously mentioned, seven public roads cross the railbed. In addition, approximately 52 private driveways serving more than five private properties, and approximately 81 residential paths are located along the railbed. The residential paths provide property owners access to East Lake Sammamish Parkway, private residences, beaches, and parking areas.

Sight distance was examined for all roadways and private driveways crossing the trail corridor to determine locations where vegetation or terrain obstructs a driver's view of the railbed. Stop signs exist at many driveway crossings of the railbed, due to poor sight distance. Of the estimated 52 driveways and seven public roads that cross the railbed corridor, approximately 39 have sight distance deficiencies for at least one corner of the intersection. Of the estimated 43 driveways and roadways that intersect with affected areas of East Lake Sammamish Parkway and East Lake Sammamish Place, approximately 22 have sight distance concerns. An inventory of potential sight distance concerns at these driveway and roadway crossing locations can be found in the Trail Intersections Appendix (King County, FEIS, 2000a). Sight distance limitations located at many driveways along East Lake Sammamish Parkway are documented in the *East Lake Sammamish Parkway Design Assessment Report* (Parsons Brinckerhoff, 1998).

Existing Accidents

Accident records for East Lake Sammamish Parkway were reviewed for the most recent five-year period available in each jurisdiction, with the exception of Issaquah, where only the last three years were available. Accident records for East Lake Sammamish Parkway were analyzed for the entire length of the proposed Interim Use Trail because trail users may cross the Parkway in several places to access the trail, including the portion of trail proposed for the Bypass Alternative. Accident records include vehicle, pedestrian, and bicycle accidents. In the City of Redmond, accident records were available for the period between September 1, 1994, and August 31, 1998. King County provided information for the area in the recently incorporated City of Sammamish, as well as unincorporated King County, for the years 1992 to 1996. The City of Issaquah provided accident information for the period between October 12, 1997, and November 11, 1999. Accident rates and accident severity (property damage only, personal injury, fatality) were reviewed for all locations in which accident data were available. The results of this analysis are shown in Table E-2 for the City of Redmond and Table E-3 for the City of Sammamish. Detailed accident descriptions were not provided for the single intersection in Issaquah.

As shown in Table E-2, the highest number of accidents in Redmond occurred at the Redmond-Fall City Road intersection. This intersection serves the highest traffic volume in this segment of East Lake Sammamish Parkway. Very few accidents were recorded in other areas of East Lake Sammamish Parkway within the City of Redmond. No fatalities or accidents involving pedestrians or bicycles were recorded in this segment.

As shown in Table E-3, the highest accident rates in Sammamish and King County were reported at the Issaquah/Fall City Road, NE Inglewood Hill Road, and SE 56th Street intersections. These intersections also serve the highest traffic volumes within this segment of East Lake Sammamish Parkway. Accidents involving a pedestrian or bicycle were also observed at the NE

18th Place, SE 56th Street, and Issaquah/Fall City Road intersections; however, only one of these accidents was observed at each of these locations during the five-year period surveyed. No fatalities were recorded within this segment of East Lake Sammamish Parkway between the years 1992 and 1996.

Accidents recorded for the NW Gilman Boulevard/Front Street N intersection in Issaquah for the period between September 12, 1997, and November 11, 1999 show three accidents in 1997, 15 accidents in 1998, and 18 accidents in 1999. During this time period, none of the recorded accidents involved bicycles or pedestrians, and no fatalities were recorded for this intersection.

Table E-2. East Lake Sammamish Parkway 5-Year Accident History in the City of Redmond.

Location	Year 1 (9/1/94-8/31/95)			Year 2 (9/1/95-8/31/96)			Year 3 (9/1/96-8/31/97)			Year 4 (9/1/97-8/31/98)			Year 5 (9/1/98-8/31/98)			5-Year Avg.
	PDO	I	F	PDO	I	F	PDO	I	F	PDO	I	F	PDO	I	F	
Redmond-Fall City Road Intersection	10	7	0	18	5	0	10	8	0	8	1	0	8	2	0	15.4
South of Redmond-Fall City Road	0	0	0	0	0	0	1	0	0	2	1	0	0	0	0	0.8
North of NE 65th Street	2	2	0	2	1	0	0	0	0	1	0	0	0	0	0	1.6
NE 65th Street Intersection	5	0	0	5	2	0	2	0	0	1	0	0	0	0	0	3
South of NE 65th Street Intersection	0	0	0	0	0	0	2	1	0	0	0	0	0	0	0	0.6
North of 187th Avenue NE	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0.6
187th Avenue NE Intersection	2	0	0	1	0	0	3	0	0	1	0	0	0	0	0	1.4
South of 187th Avenue NE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Source: City of Redmond Traffic Engineering Department (1999)
PDO = Property damage only I = Personal injuries F = Fatalities

Table E-3. East Lake Sammamish Parkway 5-Year Accident History in the City of Sammamish and Unincorporated King County.

Location	Year 1 (1992)			Year 2 (1993)			Year 3 (1994)			Year 4 (1995)			Year 5 (1996)			5-Year Avg.
	PDO	I	F	PDO	I	F	PDO	I	F	PDO	I	F	PDO	I	F	
At NE 49th Place	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0.4
At 196th Avenue NE	1	3	0	0	1	0	0	1	0	2	0	0	3	7	0	3.6
At E. Lake Sammamish Shore Lane NE	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0.4
At NE 33rd Place	2	1	0	1	1	0	0	0	0	0	0	0	0	0	0	1
At NE 30th Court	1	1	0	0	0	0	1	0	0	0	2	0	0	0	0	1
At NE 18th Place	0	3[a]	0	0	1	0	1	4	0	2	1	0	3	2	0	3.4
At NE 16th Street	0	2	0	1	1	0	2	1	0	1	2	0	0	2	0	2.4
At NE Inglewood Hill Road	5	4	0	7	6	0	3	5	0	5	6	0	3	5	0	9.8
At NE 7th Court	0	1	0	1	1	0	0	0	0	0	0	0	0	2	0	1
At Louis Thompson Road	0	1	0	0	1	0	1	1	0	3	0	0	0	0	0	1.4
At E. Lake Sammamish Park S.	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0.2
At East Lake Sammamish Parkway	1	1	0	1	1	0	0	1	0	0	0	0	0	0	0	1
At East Lake Sammamish Shore Lane NE	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0.4
At SE 16th Street	0	0	0	1	0	0	2	0	0	0	1	0	0	0	0	0.8
At E. Lake Sammamish Place SE	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0.2
At SE 22nd Place	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0.6
At SE 24th Way	1	0	0	0	1	0	0	0	0	2	4	0	2	0	0	2
At SE 26th Street	0	0	0	1	2	0	2	1	0	0	0	0	0	1	1	1.6
At SE 32nd Street	1	0	0	0	0	0	0	1	0	2	0	0	0	0	0	0.8
At SE 33rd Street	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2
At SE 39th Street	1	0	0	0	1	0	1	0	0	1	1	0	0	0	0	1
At 205th Avenue SE	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4
At 206th Avenue SE	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0.4
At 212th Way SE	1	0	0	1	1	0	0	2	0	2	1	0	0	0	0	1.6
At E. Lake Sammamish Shore SE	0	0	0	1	0	0	1	0	0	1	1	0	0	0	0	0.8
At Peregrine Point Way SE	3	0	0	0	0	0	0	1	0	1	2	0	0	0	0	1.4
At SE 43rd Way	2	0	0	1	3	0	2	5	0	3	3	0	8	3	0	6
At SE 51st Street	0	0	0	0	1	0	1	0	0	0	3	0	0	0	0	1
At SE 51st Place	1	1	0	1	2	0	2	1	0	1	1	0	0	2	0	2.4
At SE 56th Street	4	1	0	0	2	0	4	2	0	4	6[b]	0	7	9	0	7.8
At SE 62nd Street	2	0	0	0	3	0	0	2	0	3	3	0	3	3	0	3.8
At Issaquah/Fall City Road	4	3	0	13	5	0	15	3	0	34	12	0	21	7	0	23.4
At 228th Avenue SE	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0.4
At 229th Avenue SE	1	1	0	2	1	0	1	3	0	2	1	0	1	1	0	2.8

Source: King County Department of Public Works (1999)
PDO = Property damage only I = Personal injuries F = Fatalities
[a] An accident involving a bicycle was observed at this location. [b] An accident involving a pedestrian was observed at this location.

IMPACTS

The impacts evaluated include traffic volumes, parking, safety associated with railbed and driveway crossings, and public service vehicle access. When compared to the No Action Alternative, impacts associated with the Preferred Alternative and the Bypass Alternative would be greater.

Preferred Alternative

Construction-related Impacts

Approximately 7,100 cubic yards (cy) of gravel would be placed along the entire length of the railbed. Under the Preferred Alternative, approximately 1,428 one-way truck trips (714 in/714 out) would be generated for hauling the gravel to the railbed. These trips would be spread out over a 2 to 3 month period, resulting in an average of approximately 28 truck trips per day assuming no hauling on weekends. Trucks would access the project corridor from public streets, and the staging area for the placement of the gravel would take place on the railroad to minimize impacts to adjacent private property. Therefore, traffic flow and public access would not be disrupted. The assumed duration for the installment of gravel for the entire trail is two to three months.

Long-term Impacts

Once completed, the Preferred Alternative would generate an estimated 200 one-way daily vehicle trips on a peak summer weekend day. These vehicle trips are based on the estimated number of trail users, which represents approximately 10 to 20 percent of current daily totals on paved regional trails such as the Burke-Gilman Trail. The lack of a paved surface would limit possible use by strollers, road bicycles, in-line skaters, and most families, leaving primarily walkers and mountain bicyclists as the typical Interim Use Trail users. This estimate is based on an assumed daily trail user volume of 500, with half of the users driving to the trail from outside the immediate area. With an assumed average vehicle occupancy of two, the 250 trail users would generate 125 round-trips or 250 one-way daily vehicle trips. Based on studies conducted for the Burke-Gilman Trail in 1995, weekend peak volumes typically occur during the midday hours and taper off in the evening. Of the hours surveyed (7 a.m. to 7 p.m.), approximately 12 to 15 percent of the total daily volume occurred during the peak hour (2-3 p.m.) on a typical weekend day. Assuming that this would also be true for the East Lake Sammamish Interim Use Trail, approximately 30 to 38 one-way vehicle trips would be expected during the peak hour. This amount of traffic would not have an appreciable impact on roadway congestion or roadway operations, particularly because these trips would be spread out over the entire length of East Lake Sammamish Parkway NE/SE.

Parking

Based on projected trip generation estimates, as previously described, a daily parking demand of up to 125 vehicles could be expected on a summer weekend day. Assuming that an average

Interim Use Trail user would remain on-site for three hours, parking demand during the peak midday period could range between 38 to 75 vehicles at any given time. Most of these vehicles would park at Marymoor Park, Lake Sammamish State Park (near the picnic/swimming area), Issaquah District Court on NE 70th Street, or on NE 65th Street. These locations would have sufficient parking available to accommodate the peak parking demand generated from interim use of the railbed. Five to 10 days out of the year when Marymoor Park hosts large events, parking demand could increase and trail users would be required to pay a nominal fee at the Park.

Trail users would be discouraged from parking on the shoulders of East Lake Sammamish Parkway because there are few public access points to the trail and parking on the parkway would encourage illegal access in some areas.

Railbed Crossings

The project would increase the potential for conflicts between trail users and vehicles at railbed intersections with roadways and driveways. Due to the close proximity of the railbed to residential driveways and East Lake Sammamish Parkway in many locations, sight distance would be limited for vehicles as well as for pedestrians and bicycles using the trail.

Few standards are available for assessing adequate sight distance at trail-roadway intersections. However, sight distance is a principal element of roadway and path intersection design. Stopping sight distance, which is the distance required for a vehicle or bicycle to react to the unexpected, is most important at intersection locations where stop or yield signs would not be present. Based on the *Guide for the Development of Bicycle Facilities* (AASHTO, 1999), a 75-foot minimum stopping sight distance would be required for a bicycle traveling at a speed of 12 mph. For vehicles traveling at 20 mph, 125 feet of stopping sight distance would be required, based on *A Policy on Geometric Design of Highways and Streets* (AASHTO, 1994).

Washington State Department of Transportation's (WSDOT's) *Design Manual* (1997) also provides a method for determining the minimum required sight distance for motor vehicles approaching intersections. Based on WSDOT's methodology, drivers of vehicles approaching from a distance 10 feet away from a trail crossing should be able to see a trail user approaching from a distance 160 feet away from the trail crossing. These sight distance criteria would apply in locations where vehicles would be required to yield to trail users. If sight distances do not meet this criteria, motor vehicles would be required to stop.

At locations where the roadway is given the right-of-way and trail users are required to stop, sufficient crossing maneuver sight distance should be provided. Crossing sight distance is the distance required for a pedestrian or bicyclist to make a safe crossing maneuver after coming to a complete stop. Based on *Trail Intersection Design Guidelines* (North Carolina Highway Safety Research Center, 1996), a crossing sight distance of approximately 341 feet would be required for pedestrians crossing a 16-foot roadway with on-coming vehicular traffic travelling at 30 mph. A crossing sight distance of approximately 295 feet would be required for bicyclists crossing under similar conditions. Due to the sharp turns, steep grades and narrow widths of some residential driveways and the close proximity of homes to the railbed corridor, vehicles approaching most of the East Lake Sammamish Interim Use Trail intersections would be travelling at considerably lower speeds. Bicycles would also likely travel on the gravel trail at

speeds 25 percent lower than on a paved trail. Therefore, pedestrian and bicycle crossing sight distance requirements would be expected to be lower for the Interim Use Trail.

Sight distance surveys were conducted along the entire length of the East Lake Sammamish Interim Use Trail corridor to identify the locations where sight distance concerns exist. For the most part, sight distance deficiencies were identified based on information provided in the published guidelines mentioned above. However, since less than 100 feet of roadway or driveway would be available on either side of the Interim Use Trail corridor in many cases, some professional judgment was required to identify sight distance deficiencies. The Trail Intersections Appendix (King County, FEIS, 2000a) lists all impacted driveways and roadways, and identifies the locations where sight distance concerns exist.

Based on the surveys, sight distance limitations exist at approximately 39 of the estimated 52 total railbed driveway crossings. Without improvements, there is a greater potential for accidents to occur at intersections with sight distance deficiencies. The Preferred Alternative includes the installation of informational and regulatory signs for trail users and road-based vehicles. In locations where trail users would have the right-of-way, yield signs for vehicles would be placed at railbed crossings without major sight distance concerns. Stop signs for vehicles and/or vegetation management have been recommended for vehicles at railbed crossings where sight distance deficiencies exist. In locations where vehicles have right-of-way, trail users would be required to stop. Figures E-1, E-2, E-3, E-4, and E-5 show five potential trail signing plans that would be implemented for improving vehicular and non-motorized safety, depending on available sight distance and traffic volumes at each crossing location.

The entire length of the railbed is separated from East Lake Sammamish Parkway, minimizing potential conflicts between trail users and vehicles, compared to Alternatives 1 and 2.

Public Service Vehicle Access

Bollards would be installed at all trail/roadway crossings. The placement of removable bollards would provide access for maintenance and emergency vehicles, but block the trail from use by other motor vehicles. According to staff from King County Parks and Recreation, maintenance of the East Lake Sammamish Interim Use Trail would be similar to that of the Snoqualmie Valley Trail. In the winter months, county staff estimates maintenance inspections would occur twice per month, and actual maintenance two to four times per month. In the growing season (March through October) maintenance inspections would be similar, and maintenance activities would occur six to twelve times per month. Access for all public service vehicles would be via public streets.

Alternative 1 Bypass

Construction-related Impacts

The Bypass Alternative includes all of the construction and maintenance/operation actions noted for the Preferred Alternative, but would also require several additional actions to allow for the construction of the proposed Bypass route. Alternative 1 would require the widening and re-

striping of East Lake Sammamish Place, and provide an 8-foot area for pedestrians and bicycles and two 12-foot travel lanes. East Lake Sammamish Parkway would also be restriped to provide an 8- to 10-foot shoulder on the west side (for pedestrian and bicycle traffic), two vehicular travel lanes (one lane in each direction), and a 2 to 3-foot minimum shoulder on the east side Construction duration for these improvements would be 3 to 4 weeks.

Compared to the Preferred Alternative, Alternative 1 would result in a decrease in truck trips hauling gravel to the railbed, since approximately 1.6 miles of the trail would be moved from the railbed to East Lake Sammamish Parkway and East Lake Sammamish Place. Approximately 6,000 cy of gravel would be placed along the portions of the railbed used for Alternative 1. This would generate approximately 1,216 one-way truck trips (608 in/608 out over a two to three month period or approximately 24 trips per day). This decrease in truck traffic, as compared to the Preferred Alternative, would be offset by an increase in truck trips related to construction of East Lake Sammamish Parkway Bypass. The construction of the Bypass Alternative on East Lake Sammamish Parkway would add up to 2 additional weeks to the 2 to 3 months of construction needed for the Preferred Alternative. Safety measures discussed in the Preferred Alternative would also apply to Alternative 1. In addition, there could be some short-term temporary lane closures requiring flaggers on East Lake Sammamish Parkway.

Long-term Impacts

Long-term impacts for Alternative 1 would be similar to the Preferred Alternative, except where the alignment is located on the west side of East Lake Sammamish Parkway and East Lake Sammamish Place SE. Trail user safety would be lower along the bypass section because of the reduced separation between vehicles and trail users. Safety risks would be highest during peak traffic periods and/or periods of reduced visibility.

Parking

Parking demand and other parking impacts associated with this alternative would be similar to those described for the Preferred Alternative, except in the vicinity of the 1.6 mile railbed bypass area. Where the Bypass is located on East Lake Sammamish Parkway, on-street parking would be prohibited on the west side of the street. Trail users would also be prohibited from parking on East Lake Sammamish Place.

This alternative could encourage greater use of the East Lake Sammamish Parkway shoulders north and south of the railbed bypass area, since increased trail access opportunities would exist in this area. This increase in parking on the shoulders would impact existing bicycle travel and could restrict sight distance at driveways.

Trail Crossings

For portions of this alternative that are on the railbed, impacts would be the same as discussed for the Preferred Alternative.

Moving a portion of the trail onto East Lake Sammamish Parkway would have an impact on traffic operations. Travel speeds for vehicles turning from East Lake Sammamish Parkway

across the trail would need to be much slower than for the Preferred Alternative, which could result in a higher risk of rear-end accidents where the trail is re-routed onto East Lake Sammamish Parkway. No vehicle stacking space is available for southbound right and northbound left turning vehicles on East Lake Sammamish Parkway to pull out from through-traffic lanes. In addition, it is less safe to decrease the separation distance between the parallel roadway (East Lake Sammamish Parkway) and the trail.

Sight distance deficiencies for the portions of the Bypass Alternative on East Lake Sammamish Parkway were identified based on information in the *East Lake Sammamish Parkway Design Assessment Report* (Parsons Brinckerhoff, 1998). For the portion of the Bypass Alternative on East Lake Sammamish Place, surveys were conducted to identify sight distance concerns. The Trail Intersections Appendix (King County, FEIS, 2000a) lists the driveways and roadways along East Lake Sammamish Parkway and East Lake Sammamish Place that would be impacted by the Bypass Alternative, and identifies the locations where sight distance concerns exist. As shown in the Trail Intersections Appendix, sight distance limitations exist at approximately 22 of the estimated 43 trail/driveway intersections on East Lake Sammamish Parkway and East Lake Sammamish Place. In addition to these locations, approximately 35 out of 45 railbed/driveway crossings, associated with Alternative 1 and portions of the Preferred Alternative, have sight distance deficiencies. Vegetation management and/or other improvements would minimize or eliminate some of the sight distance deficiencies.

Public Service Vehicle Access

Vehicle use of the trail would be limited to service and maintenance vehicles only. Frequency and access are the same as discussed in the Preferred Alternative.

Alternative 2 No Action

Construction-related Impacts

Unlike the Preferred Alternative, the No Action Alternative does not require any interim use construction. However, some maintenance and operations functions would occur. According to the King County Parks and Recreation Department, current maintenance involves inspections in response to public contacts and complaints, and when weather conditions may result in acute drainage issues. Inspections around the immediate area would continue to occur for existing problems such as hazard trees, brushing, and ditch and culvert cleaning.

Long-term Impacts

Pedestrians and bicyclists would continue to use the East Lake Sammamish Parkway shoulders under the Bypass Alternative as opposed to the Preferred Alternative. This alternative would be less safe than the other alternatives, because pedestrians and bicyclists on the shoulders would not be separated from vehicle travel lanes.

MITIGATION

Traffic

The Preferred Alternative and Alternative 2 No Action would not require any new roads or streets, or improvements to existing roads or streets. As discussed previously, Alternative 1 Bypass would require several actions to allow for the construction of the proposed Bypass route.

For both the Preferred Alternative and Alternative 1, some standard construction safety measures can be taken, such as installation of advanced warning signs, highly visible construction barriers, and the use of flaggers. In addition, a public information program regarding hours of construction or parking impacts could be instituted.

Parking

Information regarding appropriate parking would be distributed to organized user groups. Signs would need to be appropriately placed to prevent trail users from parking in private or restricted parking lots located near the trail access points. A residential parking zone (RPZ) permit system could be considered on East Lake Sammamish Place to prohibit parking by trail users. In addition, parking on East Lake Sammamish Parkway shoulders could be prohibited in certain areas where site distance is impacted for vehicles entering the parkway, or if illegal access to the railbed occurs across private driveways. Any no parking zones along with signage and enforcement are the jurisdiction of local agencies (i.e., cities of Sammamish, Redmond, and Issaquah).

If parking supply becomes an issue in the future, shared parking opportunities for Interim Use Trail users may exist at the Issaquah District Court or office park on SE 51st Street. At the office park location, the park owners/managers have been contacted to discuss the possibility of allowing some weekend and evening parking facility use. If a shared parking agreement is established at this location, King County Park System would work with the office park owner/manager to install signs and develop an ongoing monitoring and enforcement program.

Railbed Driveway Crossings

Bollards would be installed along the railbed corridor for the Preferred Alternative and portions of Alternative 1 on the railbed at all trail/roadway crossings as indicated on the development plan. Informational and regulatory signs would also be installed at all such crossings for trail users and road-based vehicles. The Trail Intersections Appendix identifies locations where sight distance improvements are needed, provides signing recommendations for each individual driveway or roadway crossing, and describes who has the right of way. In general, vegetation growth should be monitored and managed near all trail crossings to maximize sight distances for trail users and vehicles. Guard rails should also be used to delineate the trail edge where the railbed directly parallels and is connected to driveways. In addition, accident records would be monitored, and problem areas addressed.

For the section of the trail that would be re-routed onto East Lake Sammamish Parkway with Alternative 1, King County would work with the City of Sammamish to install warning signs, painted lane striping, or other improvements to protect trail users from vehicular traffic. If physical safety barriers are installed, it would not be feasible to place them within 150 to 300 feet of driveways due to sight distance concerns. This would result in gaps in the safety barriers where trail users would be unprotected from vehicle traffic. Trail users with their backs to turning vehicles are even more susceptible to unexpected conflict. Between the south end of East Lake Sammamish Place SE and SE 33rd Street, the majority of East Lake Sammamish Parkway would not allow for safety barriers between vehicular and non-motorized traffic, due to the frequency of driveways and width of the existing shoulders. This type of unprotected facility is not recommended under local and state regulations.

Placing safety barriers two feet west of the southbound travel lane would also narrow the existing space available for high speed cyclists (assuming cyclists are located between the barriers and vehicle travel lane), and therefore, be less safe. Alternatively, if high speed cyclists are traveling on the west side of the barrier, potential conflicts exist with other types of trail users (pedestrians and lower speed cyclists).

Vehicle Access

As described above, bollards would be installed at all railbed crossings. The placement of removable bollards would provide access for use by maintenance and emergency vehicles, but block the trail from use by other motor vehicles.

Construction

All truck traffic would be required to use public roads to access the railbed corridor.

APPENDIX F
CULTURAL AND HISTORICAL RESOURCES

CULTURAL AND HISTORICAL RESOURCES

AFFECTED ENVIRONMENT

Because the Preferred Alternative and Alternative 1 are within 0.25 mile of each other, the affected environment is considered here to be the same.

Native American History of Region

The proposed East Lake Sammamish Interim Use Trail is within the territory of the Sammamish, a Duwamish subgroup, and the Snoqualmie people (Ruby and Brown, 1992; Swanton, 1978). The project area was probably utilized by both of these Southern Coast Salish groups, who spoke the Lushootseed language (Suttles and Lane, 1990). Both groups resided in winter villages along shorelines, bays, and rivers and relied heavily upon salmon for subsistence. During non-winter months, groups would leave the villages for shellfish, marine and freshwater fish, land game, waterfowl, sprouts, roots and bulbs, berries, and nuts (Suttles and Lane, 1990; Gunther, 1981). Food resources acquired during the spring, summer, and fall were used for winter supplies and trade, as well as immediate consumption. The project area would have provided terrestrial game such as deer, elk, and small mammals whose meat was eaten fresh or dried for storage. A wide variety of plant resources were sought for medicinal and technological items. Tules and cattails were collected by streams and marshes and used for making mats, and western red cedar was used for rope, baskets, and numerous household items (Gunther, 1981). Haeberlin and Gunther note that canoe/tree burials were the predominant practice for the Snoqualmie (1930). The deceased would be placed in a canoe, and the canoe placed in a tree or on a frame (Suttles and Lane 1990). Often, as the canoe decayed and collapsed, the human remains would be redeposited to the ground below. Haeberlin and Gunther note that underground burial was reserved for the lower class (1930).

Following the signing of the Point Elliott Treaty in 1855, the Snoqualmie were relocated to the Tulalip Reservation (formerly called the Snohomish Reservation) along with several other groups (Ruby and Brown, 1992; Swanton, 1978). All of these groups together comprise the Tulalip Tribes of the Tulalip Reservation, although many Snoqualmie refused to move to the Reservation. Indeed, the Snoqualmie Tribe has been recently recognized by the Federal Government, an acknowledgment of their autonomy. The Sammamish were also assigned to the Tulalip Reservation, unlike other Duwamish subgroups, who were assigned to the Port Madison Reservation. However, Ruby and Brown (1992) report that the Sammamish were autonomous and apparently did not go to the Tulalip Reservation, but were possibly absorbed by neighboring groups, such as the Snoqualmie. Little has been written about the Sammamish, except to note their orientation toward seasonal exploitation of interior lakes, streams and prairies as opposed to marine resources (Geo-Recon International Ltd., 1980). Bagley notes that in 1854 the Sammamish "numbered 101 all told and were probably a band of the
is some disagreement on whether the Sammamish were an autonomous group, as discussed by Spier (1936). Spier notes that Gunther "includes Lake Sammamish, the presumable locale of the Sammamish, within Duwamish territory…" but that Curtis lists them separately as the

with territory along "…the shores of Lake Sammamish and the eastern shore of Lake

Lake Sammamish was originally known as Squak Lake (Bagley, 1929; E.J. Fish, 1981), which likely originated from Sqwa'xw, an ethnographic village identified by Waterman (ca. 1920) at the mouth of Issaquah Creek. Hitchman (1985) identifies the origins of the word Sammamish as coming from the Indian name samma ("the sound of the blue crane") and mish ("river"). "Other tribal names were Xa-tcx-atcu, meaning 'small lake' (as compared to Lake Washington), and Sts-apa-bc, which has about the same meaning" (Hitchman, 1985).

Native American Cultural Resources Identified in the Vicinity of Project Area

Prehistoric sites are located in the vicinity of the proposed project area at both the northern and southern ends of the route. Six prehistoric sites, including the Marymoor Site (45KI9) are within one mile of Segment 1 of the proposed East Lake Sammamish Interim Use Trail (Table F-1). The Marymoor site was identified in 1964 and excavations there in the 1960s determined the site was an occupation area. Artifacts from the site included microblade cores and blades, Cascade points, large stemmed points and basalt cobble tools. Based on this assemblage and corrected radiocarbon dates, Lewarch et. al (1995) consider the site to date from between 4,200 and 2,700 years BP (before present). The Marymoor Site was listed on the National Register of Historic Places in 1970. Other small sites in the northern portion of the project area have been identified, although four of these are presumed destroyed. Two of the sites presumed destroyed were likely damaged when the Sammamish Slough was dredged and shortened in 1912 (E.J. Fish, 1981) and again in 1948 and 1963 (Robinson, 1988). Nevertheless, it is highly likely that other cultural deposits are present in the area.

Site 45KI448, a historic site with a prehistoric component has been identified within one mile of Segment 6 of the proposed East Lake Sammamish Interim Use Trail. The site was identified in 1999 and consists of a low density lithic scatter, possibly Olcott (5,000 – 8,000 BP). The prehistoric materials were mixed with more than 250 historic artifacts. The site is likely related to the historic town at Monohon (Nelson, 1998; Norman, 2000).

One prehistoric site has been identified within one mile of Segment 7 of the proposed East Lake Sammamish Interim Use Trail. The site, a lithic scatter, is along the general route of an Indian trail identified by the General Land Office in 1864.

Several documents indicate the likelihood of additional Native American-related cultural resources in the area. Waterman (ca. 1920) identifies an Indian village called Sqwa'xw on Issaquah Creek at the present Lake Sammamish State Park. Larson indicates that the longhouse at Sqwa'xw was 90 feet x 40 feet (1984). Robinson additionally notes the presence of a Sammamish burial ground "in or near the present town of Issaquah" (1986), although there is no more specific information available as to its location. Additionally, an important Native American trail that connected the Puget Sound to the eastern part of the state passes the southern end of Lake Sammamish near Issaquah Creek (Government Land Office, 1864). E.J. Fish (1981) maps an Indian hop-picker village west of the Issaquah Creek, which is likely the campsite run

by early settler Lars Wold and referred to by Craine (1983). The hop-picker village likely dated to the last half of the 19th century. Larson suggests that the hop-picker village subsumed the village noted by Waterman (1984). The potential cultural resources identified above would be in the vicinity of Segments 6 and 7.

Consultation with Ray Mullen of the Snoqualmie Tribe confirms much of the above information regarding the cultural sensitivity of the shoreline at Lake Sammamish State Park and north at Segments 6 and 7 of the proposed East Lake Sammamish Interim Use Trail corridor. Mr. Mullen considers all culverts potentially culturally significant as well. Additionally Mr. Mullen indicates the area between Louis Thompson Road south to the boundary between Segments 4 and 5 of the proposed East Lake Sammamish Interim Use Trail corridor should be considered culturally sensitive. Construction in these areas should be coordinated with tribal representatives to avoid unnecessary impacts to cultural resources.

Euro-American History of Region

Redmond and Issaquah were two main historic settlements in the region of the project area, one at either end of Lake Sammamish. Additionally, several smaller communities developed on either side of Lake Sammamish. Transportation by settlers in the region was limited to wagon roads and boat travel. Between 1860 and 1889 boats operated on what was known as Squak Lake transporting people and freight (H. Fish, 1976). In the 1880s, the railroad was constructed along the east side of Lake Sammamish. The first railroad to operate was the Seattle, Lake Shore & Eastern, which was sold to Northern Pacific in 1892. Northern Pacific continued to operate on the line until 1970 when Northern Pacific was acquired by Burlington Northern (E.J. Fish, 1981).

Redmond, to the north of Lake Sammamish, was settled in 1871 by Luke McRedmond and Warren Perrigo. Both made land claims and cleared their land on the east side of the Sammamish River. Originally, the town was called Salmonburg after the plentiful salmon running in the Sammamish River. The town came to be known as Melrose, after the Melrose House, an inn operated by the Perrigos. In 1883 McRedmond, the town's first postmaster, changed the town's name from Melrose to Redmond causing long-term bitterness between the Perrigos and McRedmonds (Stein, 1998). The main industries of the area were logging and milling which provided prosperous living for both laborers and businessmen. By 1900 the population of Redmond had reached 271 (Bagley, 1929). Redmond was incorporated on January 1, 1912, after its population reached 300 (Stein, 1998).

Present-day Marymoor Park was originally the estate of Seattle businessman James W. Clise. In 1904 Clise built a hunting lodge, known as Willowmoor, on 78 acres as part of a hunting preserve. Originally used only in summer, the lodge was enlarged by 1907 when the family moved there permanently. Clise later purchased an adjoining 350 acres. The property was developed as a model farm, used as a dairy farm and purchased by King County in 1963. The mansion currently houses the Marymoor Museum of Eastside History. Clise had a reproduction of a Dutch windmill built at Willowmoor around 1905. The windmill was originally designed for grinding grain but was converted in the 1940s to a water pump (Gemperle, 1972).

Issaquah, at the south end of Lake Sammamish, was first settled by several families in 1863 (E.J. Fish, 1981). Ingebright Wold was issued a homestead at what would become the town of Issaquah. Originally known as Olney, the town was incorporated as Gilman in April 1892. Issaquah became the town's permanent name in February 1899. Coal was discovered along the Squak River in 1862, although mining operations were not in place until 1887. Dairying, hop farming, and logging joined mining as the major industries of the Issaquah area.

The Casto (or Castro) family homesteaded the parcel now known as Pickering Farm. In November 1864, a group of Native Americans attacked the settlers at Issaquah Creek, seeking retribution for the deaths of several of their members. The Casto family was slain and four of the Native Americans were killed in the siege that was later known as the Squak Massacre. Many of the remaining settlers moved to Seattle following the conflict and the area was resettled the following year (Bagley, 1929; E.J. Fish, 1981). Territorial Governor William Pickering, Sr., bought the Casto property in 1867 and his descendants operated a dairy farm there until 1975. The Pickering barn and adjacent land were placed on the National Register of Historic Places in 1983.

Smaller communities developed between Redmond and Issaquah, including Campton, Monohon, and Inglewood. Logging operations existed all around Lake Sammamish between the 1880s and 1920s (Bagley, 1929). The combination of access to the lake for transport of logs to the mill and access to the railroad for transport of lumber to the market influenced the development of the mills in these locations. Several mills were located in the immediate vicinity of the project area. The Campbell Mill, Weber Shingle Mill, and Allen & Nelson Mill at Monohon were several of the more prominent mills on the east side of Lake Sammamish (E.J. Fish, 1981). Mill sites often became company towns as mill workers built houses and farmed.

An example of a company town was in Monohon, which was homesteaded by Martin Monohon in 1877. In 1888 the Donnelly Post Office moved across Lake Sammamish from the west side to the east side to be nearer to the Seattle, Lake Shore and East Railroad (History Link, 2000). The Allen & Nelson Mill was established there in 1889 to be near the railway. "Fifty homes and a 20 room hotel were built for employees. In 1892, Monohon had the sawmill, a coal mine, and a population of 80. The main products were lumber, hops…, and dairy products" (History Link, 2000). E.J. Fish (1981) notes that Monohon Mill was the biggest lumber producer on Lake Sammamish and reached its peak in the early 1920s. The mill and much of the town burned down in 1926 and the post office closed soon after.

E.J. Fish notes an Indian hop-picking village to the west of Issaquah Creek (1981). The Wold hop farm in the Issaquah area expanded from a half an acre in 1868 to 50 acres in 1893 before the industry died out in Issaquah by 1900 (E.J. Fish, 1981). Hop-picking was seasonal work which drew local Native Americans as well as Chinese immigrants to work in the hop fields near Issaquah Creek. A riot against the Chinese workers occurred in 1885 on the Wold hop farm (E.J. Fish, 1981; Craine, 1983).

Euro-American Cultural Resources Identified in the Vicinity of Project Area

Historic sites have been identified both within one mile of, and adjacent to, the project area. Four historic sites have been identified within one mile of Segment 1 of the proposed East Lake Sammamish Interim Use Trail corridor. Clise Mansion, listed on the National Register of Historic Places in 1973, and the Dutch windmill, listed on the State Register of Historic Places in 1973 are within the current Marymoor Park to the west of the project area. The William White Mansion, owned by Justice White who married Redmond co-founder Luke McRedmond's daughter, is located northwest of the project area. The Yellowstone/Red Brick Road, a historic road to the east of the project area was listed in the National Register of Historic Places in 1973. This site also extends to within one mile of Segment 2 of the proposed East Lake Sammamish Interim Use Trail corridor.

One historic site with prehistoric component (45KI448) has been identified within one mile of Segment 6 of the proposed East Lake Sammamish Interim Use Trail corridor. Over 250 artifacts were collected at the site, with 240 historic artifacts which suggests a historic occupation, although no structures were observed (Norman, 2000). The site is in the vicinity of the Allen & Nelson Mill at Monohon and may be associated with the town of Monohon.

Four historic sites have been identified within one mile of Segment 7 of the proposed East Lake Sammamish Interim Use Trail corridor. The Pickering Barn (45KI142H) was built in two phases in 1890 and 1906. The site includes the presumed remains of the Casto cabin. Pickering Barn was listed on the National Register of Historic Places in 1983 and is also subject to the Issaquah Municipal Code (Larson, 1984). Site 45KI451, an abandoned railway grade is located southeast of the project area. It is likely related to mining or logging activities in the region. Site 45KI452 is represented by concrete reservoir features associated with the Issaquah Water Works. Site 45KI453, a concrete foundation, is southeast of the project area, on the north side of Interstate 90.

There are several indications of additional historic cultural resources in the project area. At the former location of Campton, the Campbell Mill Boarding House (KC0523) was identified by the King County Cultural Resources Department in 1978 as locally significant. The boarding house was built in 1910 and is the only remaining house built by the Campbell Mill. The mill started at the turn of the century and continued operating through ca. 1930. Pilings at the northeast end of Lake Sammamish are the only remains of the mill itself. The pilings are visible from the existing railbed. The above resources are adjacent to Segment 2 of the proposed East Lake Sammamish Interim Use Trail corridor. The King County Cultural Resources Department identified a cluster of unrelated but locally significant buildings near Weber Point in 1978. While only one structure appears to have survived to date, the area may still contain intact historic deposits. This potential resource is located adjacent to Segment 3 of the proposed East Lake Sammamish Interim Use Trail corridor. Similarly, there is a potential for historic cultural resources near Inglewood in Segment 4 and Monohon in Segment 5, although no structures that still exist were identified by King County Cultural Resources Department. King County Cultural Resources Department identifies the location of the Frank Tibbetts house (KC0168) immediately adjacent to the railbed in Segment 7. Almost directly across the tracks, E.J. Fish locates the Anton Ek house (1981). Neither structure is extant, but both could be considered locally significant since Tibbetts and Ek

were Issaquah pioneers. Larson (1984) and Nelson (1994) note that sites are likely to occur close to Issaquah Creek, which intersects the project area in Segment 7. Nelson considers the area to have high probability for cultural resources with strong local importance (1994).

Table F-1. Recorded Cultural and Historic Resources Identified Within One Mile of Project Area

Vicinity	Site Number/Name	Site Type	Status
Segment 1	45KI8	Presumed occupation	(probably destroyed)
Segment 1	45KI9/Marymoor Site	Prehistoric occupation	Listed NRHP 1970
Segment 1	45KI10	Presumed occupation	Not eligible
Segment 1	45KI190H/Justice Wm. White House	Historic residence/estate	Eligible to NRHP
Segment 1	45KI191H/Marymoor Museum (Clise Residence)	Historic residence/estate	Listed NRHP 1973
Segment 1	45KI192H/Dutch Windmill	Dutch reproduction windmill	Listed SRHP 1973
Segment 1	45KI266	Possible prehistoric camp	(destroyed)
Segment 1	45KI466/Bear-Evans Creek Site	Prehistoric camp/historic roadbed	Not eligible
Segment 1	45KI467/Union Hill Road Site	Prehistoric/historic scatter	(destroyed)
Segments 1-2	45KI196H Yellowstone/Red Brick Road	Historic road	Listed NRHP 1974
Segment 6	45KI448	Prehistoric/historic scatter	Not eligible
Segment 7	45KI142H/Pickering Farm	Historic dairy farm	Listed NRHP 1983
Segment 7	45KI451H	Railway grade	Not eligible
Segment 7	45KI452H	Concrete reservoir features	Not eligible
Segment 7	45KI453H	Concrete foundation	Not eligible
Segment 7	45KI457	Prehistoric lithic scatter	Not eligible

NRHP: National Register of Historic Places
SRHP: State Register of Historic Places

IMPACTS

The impacts of the Preferred Alternative and Alternatives 1 and 2 are discussed below. All segments of the corridor have some potential for unknown cultural resources. Specific segments with higher potential risk for cultural resources are Segment 1, Segment 2, the area north of Weber Point in Segment 3, Segment 4 from Louis Thompson Road south to the Segment 5 boundary (for both the Preferred Alternative and Alternative 1), the boundary between Segments 5 and 6, the northern portion of Segment 6, and Segment 7. It is important to note that additional unknown cultural resources may potentially exist outside of the above areas. When compared to the No Action Alternative, impacts associated with the Preferred Alternative and the Bypass Alternative would be greater.

Preferred Alternative

Gravel Placement

No impacts to cultural or historic resources are anticipated, because there would be no subsurface disturbance.

Culvert Maintenance

Impacts to cultural and historic resources range from low to moderate depending on the maintenance measures. General maintenance of culverts has low potential to disturb unknown cultural resources. If excavation into the native soil below culvert gravels occurs, such as for installation of a catch basin, the probability increases to a moderate potential that unknown cultural resources may be disturbed. It is important to note that the tribes in particular generally consider culverts to have potential undisturbed cultural deposits associated with them, and have requested that tribal representatives monitor any excavations in these areas. Culvert replacement is not planned for the Interim Use Trail, but may be a part of the Master Plan.

Signage/Bollards

Impacts to cultural and historic resources range from low to potentially high depending on the installation method and location. There is low potential to disturb unknown cultural resources when excavating/installing bollards in the existing railbed. Depending on location of the signage, the potential to disturb unknown cultural resources ranges from low to high. Some areas impacted by signage may still contain intact unknown cultural deposits related to historic mills or prehistoric land use associated with the shoreline resources and creeks. The use of heavy equipment may increase the potential impact for both these activities.

Fencing

Impacts range from low to potentially high, depending on the location and type of installation associated with the placement of fencing. Direct drive installation of fence posts would have minimal potential to disrupt cultural resources; however, excavation for concrete posts could disrupt resources. It is recommended that potentially sensitive areas be identified and surveyed prior to construction, and that tribal representatives be available to monitor construction in areas with high potential for cultural resources.

Trail Usage

Impacts resulting from trail usage are expected to be low. Trail users would be required to stay on the trail and measures such as fencing and signage would be used to ensure they comply. This should minimize potential impact to cultural resources.

Alternative 1 Bypass

Gravel Placement

Potential impacts associated with gravel placement are the same as those identified for the Preferred Alternative.

Culvert Maintenance

Potential impacts associated with culvert maintenance are the same as those identified for the Preferred Alternative.

Signage/Bollards

Potential impacts associated with signage/bollards are the same as those identified for the Preferred Alternative.

Ramp Construction

Unlike the Preferred Alternative, Alternative 1 Bypass requires the construction of ramps to move the proposed trail away from the existing railbed. The impact of the activities associated with ramp construction depends on the methods and equipment used. The use of heavy equipment may increase the potential impact from these activities. The use of fill would have low to no impact on buried cultural resources, while earthmoving of intact soil increases the likelihood of disturbing unknown cultural resources.

Trail Usage

Potential impacts associated with trail usage are the same as those identified for the Preferred Alternative.

Alternative 2 No Action

Maintenance

Maintenance activities are anticipated to have a minor impact to cultural and historic resources as long as no ground disturbing activities take place off the railbed. Refer to the discussion under the Preferred Alternative for potential impacts related to culvert replacement.

MITIGATION

To mitigate potential disturbance of unknown cultural resources, an archaeological monitor would be present at all construction activities that involve excavation into native soils.

An archaeologist would be consulted regarding the placement of signs, bollards, and fences off of the railbed to avoid disturbing buried cultural deposits. If general areas are identified where signs, bollards, and fences would be installed, an archaeologist can identify more specific locations with low or no probability for disturbing unknown cultural resources.

No specific archaeological sites should be identified or located on the signage.

If cultural resources are identified during construction activities, work should halt in the immediate area and the appropriate city or county department and the Washington State Office of Archaeology and Historic Preservation should be contacted.

APPENDIX G
FISH PASSAGE AND HABITAT SUMMARY

Fish Passage and Habitat Summary at Stream Culvert Crossings

Culvert ID	Trail Station	Stream ID	Type	General Description	Observations Fish Crew 2001	Sediment Depth (Inches)	1st Fish Passage Barrier	2nd Fish Passage Barrier	3rd Fish Passage Barrier	Habitat Rating Below Railbed	Habitat Rating Above Railbed	Potential to Extend Habitat	Fish Use	
2B-2A	597.6	0143A	Concrete	Perennial Stream	The pipe spills 10" onto rocks - there is no plunge pool. The culvert under Parkway is dark, and likely a barrier also. Fish habitat to the lake is very poor.	0	Driveway culvert	Railbed culvert	Parkway culvert (likely)	None	None	No	Unlikely	N/A
3B-1	551.5	0143B	Concrete	0143C joins just above railbed	Piped to the lake; above it filters through roadside ditch grass.	0	Pipe under residence	Railbed culvert	Parkway culvert	None	None	No	No	N/A
3C-1	537.6	0143D	CMP	Flows through Wetland 32 US of railbed	A shallow race over compact silt, roots & hardpan. Drops 14" to irregular slope with roots at outlet.	0	Railbed culvert	Parkway culvert		Fair	None	Yes	Potential	Low
3C-2	532.3	0143E	Concrete	Flows through Wetland 31 US of railbed		1/4	Unknown			None	None	No	No	N/A
3C-3	526.5	0143F	CMP	Perennial Stream	Shallow with low falls and no pools @ lake; very questionable access to stream. Dammed for incubator water supply.	0	Parkway culvert			Fair	Fair	Yes	Potential	Low
3C-4	524	0143G	CMP	Perennial Stream	Mostly a gravelly riffle all the way to the lake.	0	Unknown			Fair	None	Unknown	Potential	Low
3C-5	509.1	0143M	Concrete	Perennial Stream	Flows along east side of railbed and joins 3C-4.	0				N/A	None	No	Unlikely	N/A
3C-6A	501.8	0143H	Concrete	Perennial Stream	Upstream of culvert is very steep (25% slope) and there is another pipe coming out from Parkway with a 12-18" drop (from catchment?). Railbed culvert is 50% sedimented and downstream steep and channelized.	10	Parkway culvert			Poor	None	No	Unlikely	N/A
3-C12	485.9	0143J	CMP		Inlet had 2" sediment. Outlet is plastic 12" pipe, with a 10" vertical drop. Slope of pipe is high. Fish passage barrier.	2	Railbed culvert	Slope above railbed culvert		Fair	Poor	Yes	Potential	Low

Culvert ID	Trail Station	Stream ID	Type	General Description	Observations Fish Crew 2001	Sediment Depth (Inches)	1st Fish Passage Barrier	2nd Fish Passage Barrier	3rd Fish Passage Barrier	Habitat Rating Below Railbed	Habitat Rating Above Railbed	Potential to Extend Habitat	Fish Use	
4A-1	472.3	0143K	Concrete	Perennial Stream	Heavily vegetated with zero flow on 9 April 2001.	4				None	None	No	Unlikely	N/A
4B-1	462.6	0143L	Concrete	Perennial Stream: Flows through Wetland 30 US of railbed	Stream is same source as 4B-2. Bottom 1/3 of pipe outlet, and bottom 1/4 of inlet sedimented. Very steep from outlet to lake.	8	Parkway culvert			Fair	Fair	Yes	Potential	Moderate
4B-2	458.8		Concrete	Flows through Wetland 30 US of railbed	18" vertical drop at end of outlet and steep step-falls to lake. Both inlet and outlet heavily vegetated. Inlet has 6" drop into culvert. LSP culvert outlet has impassable 4-5 foot vertical drop. Fish cannot get to small amount of habitat below the railbed.	0	Railbed culvert	Parkway culvert		Fair	Fair	Yes	Potential	Low

Culvert ID	Trail Station	Stream ID	Type	General Description	Observations Fish Crew 2001	Sediment Depth (Inches)	1st Fish Passage Barrier	2nd Fish Passage Barrier	3rd Fish Passage Barrier	Habitat Rating Below Railbed	Habitat Rating Above Railbed	Potential to Extend Habitat	Fish Use	
4C-1	439.8	George Davis	Concrete	Class 2 Perennial Stream		6	Culvert with racked vault below railbed	Trash rack on Parkway culvert		Fair/Good	Fair/Good	No	Yes	N/A
4C-1		George Davis	Clay		Both pipes under railbed are half full of sediment. Another 24" culvert with a storm drain lies 5' downstream. The culvert under Parkway has a trash rack and is a fish passage barrier.	18								N/A
4C-4	423	Zaccuse Ck	Concrete	Class 2 Perennial Stream, Wetland 26	10-12" vertical drop to plunge pool at outlet. 2'x2'box culvert under driveway, just downstream from outlet. Another 36" culvert 10" further downstream. Culvert under Parkway. Block to fish passage.	0	Culvert below railbed	Railbed Culvert		Fair/Good in patches	Good	Yes	Yes	High

Culvert ID	Trail Station	Stream ID	Type	General Description	Observations Fish Crew 2001	Sediment Depth (Inches)	1st Fish Passage Barrier	2nd Fish Passage Barrier	3rd Fish Passage Barrier	Habitat Rating Below Railbed	Habitat Rating Above Railbed	Potential to Extend Habitat	Fish Use	
4C-5	410.5	Ebright Ck	Concrete		Some step pools below culvert with some sedimentation present. Restoration efforts have occurred (LWD placement) in reach below culverts. Good habitat present upstream from culverts.	0				Good	Good	No	Yes	N/A
4C-5	410.5	Ebright Ck	CMP			0						No		N/A
4C-6	400.8	0150A	CMP	Drains Wetland 25	Inlet blocked by debris/sediment/mud.	12				None	None	No	Unlikely	N/A
4C-8	383.2	155	CMP	Drains Wetland 24	A 24" plastic CP conveys beneath ELSP - about 6gpm. No habitat; drains a wetland adjacent NE 8th.	6				Good	Fair	No	Potential	N/A
4C-9	378	Pine Lake Ck	Concrete	Perennial Stream						Good	Good	No	Yes	N/A
4C-9	378	Pine Lake Ck	Concrete									No		N/A
5A-1A	356.8		CMP	Drains through Wetland 20 US of railbed	5A-1a, 5A-1b, & 5A-2 join to form one narrow, steep small stream flowing over cobble into the lake (landscaped).	0	Railbed Culvert			Fair	Fair/Poor	Yes	Potential	Low
5C-1	316.4		Concrete	Drains through Wetland 15 US/DS of railbed	The stream may be too shallow for cutthroat, but might support some kokanee spawners in November-December.	0	Railbed Culvert			Fair/Good	Unknown	Yes	Probable	Moderate
6A-1	289.7	0162A	Concrete		The stream was dry on 6 April 2001.	0				None	None	No	No	N/A
6C-1A	240.8	0163	Clay				Railbed Culvert	Parkway culvert		Fair	None	No	Likely	N/A
7A-1	213.7	Many Springs	CP	Drains to Wetland 3	Much sediment upstream and downstream. Creek flows underground 100 ft downstream of outlet.	8	Underground flow below railbed			None	None	No	Unlikely	N/A

Source: King County and DOE